catalog 2007–08

HARVARD SCHOOL OF PUBLIC HEALTH

ADVANCING THE PUBLIC'S HEALTH THROUGH LEARNING, DISCOVERY, AND COMMUNICATION

HARVARD SCHOOL OF PUBLIC HEALTH

Departments and Degree Programs, 2007–08

Department of Biostatistics

SM1, SM2, PhD

Department of Environmental Health

Exposure, epidemiology, and risk: *SM1, SM2* (including *SM2* in industrial hygiene), *SD*
Molecular and integrative physiological sciences: *SD, PhD* (through the Division of Biological Sciences)
Occupational health (including joint programs with Simmons College): *MOH, SM1, SM2, SD, DPH*

Department of Epidemiology

SM1, SM2, SD, DPH

Department of Genetics and Complex Diseases

PhD (through the Division of Biological Sciences)

Department of Health Policy and Management

SM1, SM2, SD
Health care management (part-time, nonresidential): *SM1*
Health policy: *PhD* (through university program)

Department of Immunology and Infectious Diseases

SD, PhD (through the Division of Biological Sciences)

Department of Nutrition

Nutritional epidemiology, public health nutrition: *SD, DPH*
PhD (through the Division of Biological Sciences)

Department of Population and International Health

SM2, SD, DPH

Department of Society, Human Development, and Health

(including joint programs with Simmons College)
SM1, SM2, SD, DPH
Health communication: *SM2, SD, DPH*
Maternal and child health: *SM1, SM2, SD, DPH*

Master of Public Health Program

Clinical effectiveness, family and community health, health care management and policy, international health, law and public health, occupational and environmental health, quantitative methods: *MPH*
Combined *MD-MPH*
Joint *JD-MPH* (for Harvard law students only)

Additional information on degree programs, including course requirements and electives, is available at http://www.hsph.harvard.edu/academics.html.

Definition of Terms

Degrees

DPH	Doctor of public health
MOH	Master of occupational health
MPH	Master of public health
PhD	Doctor of philosophy
SD	Doctor of science
SM1	Master of science (42.5-credit program)
SM2	Master of science (80-credit program)

Diplomas for the MPH, DPH, and MOH degrees show the degree only. Diplomas for the SM and SD degrees also show the name of the department.

All PhD programs are offered under the aegis of the Harvard University Graduate School of Arts and Sciences.

Concentrations

The names of the departments generally convey their educational and research specialization, or *concentration*. Where several concentrations are available within a department, these are listed in the chart above. In the Department of Environmental Health only, the concentrations are shown on diplomas. *Areas of interest*, described in this catalog but not listed above, are generally less formal programs than concentrations or are subspecializations within them.

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Cover: To combat malaria, bed nets are distributed to pregnant women and families in Uganda.

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HARVARD SCHOOL OF PUBLIC HEALTH

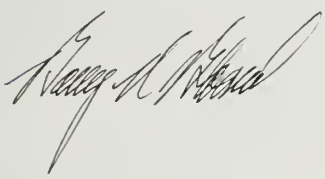
from the dean

The twentieth century witnessed the greatest gains in quality and duration of human life. Most of the gains achieved prior to antibiotics and vaccines are truly attributable to public health. In the United States, for example, life expectancy has been extended from an average of forty-seven years in 1900 to over seventy-eight years in 2007. Yet there are major disparities in life expectancy and harsh inequalities in individuals' ability to gain access to prevention and care within and between countries. Some infectious diseases have been vanquished, but others such as AIDS and SARS emerge or reemerge, as do increasingly drug-resistant strains of malaria and tuberculosis pathogens. Environmental and occupational hazards, violence and injuries, and health policy, management, and financing issues are just some of the challenges within the purview and mandate of public health. The improvement of the health of the nation's and the world's populations demands disciplinary expertise and interdisciplinary approaches to solve these problems.

The courses, departments, programs, and facilities described here in the catalog of the Harvard School of Public Health reflect the full scope of the contemporary public health enterprise. The interests and expertise of faculty at the school are similarly broad, extending across population, biological, and social and policy sciences. Our programs and projects range from the molecular biology of vaccines to the epidemiology of cancer; from women's and children's health to quality-of-care measurement; from global health and human rights to risk assessment. All of these programs are approached with a deep sense of dedication on the part of the faculty, students, and staff and with a mutual respect for different ways of contributing to our shared purpose.

Our overarching mission is to advance the public's health through learning, discovery, and communication. Our objectives are to provide the highest level of education for public health scientists, practitioners, and leaders; to foster new discoveries leading to the improvement of health of the people of this country and all nations; to strengthen health capacities and services for communities; and to inform policy debate, disseminate health information, and increase awareness of public health as a public good and a fundamental right.

We are engaged in an exciting enterprise of vital importance to every individual and to our global society. We welcome those who wish to help us meet these challenges and share the satisfying work of changing the world of health and improving the health of the world.



Barry R. Bloom
Dean

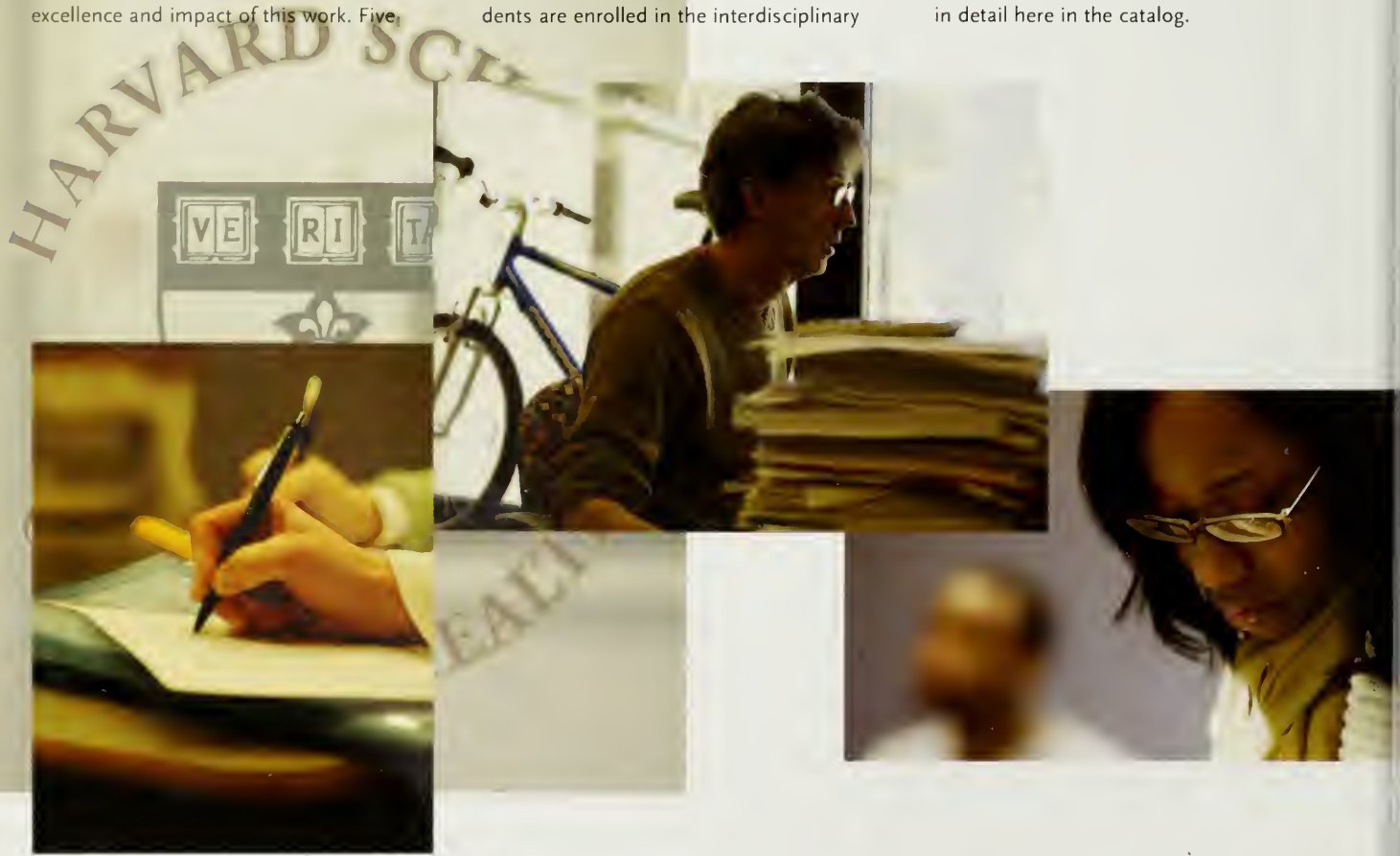
THE HARVARD SCHOOL OF PUBLIC HEALTH

The Harvard School of Public Health (HSPH) is a direct descendant of the first professional training program in public health in America, the Harvard-MIT School for Health Officers, a joint venture that began in 1913. In 1922 Harvard split off from MIT, and the Harvard School of Public Health was formally established. In 1946 the school celebrated its new status as a freestanding faculty of Harvard University, no longer an administrative part of the medical school.

Since its founding, the school, through its faculty and graduates, has been at the forefront of efforts to stem disease and promote health worldwide. During the early years the focus was on infectious diseases, deadly workplace exposures, and sanitation—from Alice Hamilton's pioneering studies of lead and mercury poisoning, to Thomas Weller's pathbreaking research on the polio virus and Philip Drinker's invention of the iron lung. More recently the school has expanded its reach to new areas, including the effects of race, gender, class, and social isolation on health; the reform of national health systems; and cutting-edge research on the biomarkers of disease. Three Nobel Prizes, a Lasker Prize, four MacArthur Awards, presidential citations, and countless other honors attest to the excellence and impact of this work. Five successive HSPH alumni led the U.S. Centers for Disease Control and Prevention for an unprecedented twenty-seven years (1962–89). More difficult to quantify —but a far better gauge—are the perceptible gains in length and quality of life that have been realized through all these efforts.

Today the faculty of the Harvard School of Public Health includes almost four hundred members from the diverse fields and disciplines that constitute public health. The student body comprises over a thousand individuals from throughout the United States and seventy-two other countries. Students, like faculty members, come from an array of fields and include physicians, health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. About 28 percent of current HSPH students are enrolled in the interdisciplinary master of public health (MPH) program, 28 percent in master of science programs, and 44 percent in doctoral (doctor of science, doctor of public health, or doctor of philosophy) programs.

The school is organized into nine academic departments, the base of most teaching and research activity; two interdisciplinary divisions (Biological Sciences and Public Health Practice); the interdisciplinary master of public health program; and a number of specialized research centers. The school's academic programs are described in detail here in the catalog.



DEGREE PROGRAMS AND REQUIREMENTS

Degree Programs

The Harvard School of Public Health offers a number of degrees and degree programs (see inside front cover), reflecting a rich educational and research environment for students of many backgrounds and interests.

The degree programs have a range of purposes and requirements. Some master's programs are intended to prepare students for professional careers in public health; others focus on research training in preparation for doctoral study. The doctoral programs are designed for students with interests in the scientific basis of public health and preventive medicine who wish to pursue academic or research positions.

Entrance Requirements

Entrance requirements for HSPH programs vary considerably by degree and also by department. Minimum entrance requirements for HSPH degree programs are as follows:

Master of public health (42.5 credit) program Candidates normally hold a doctoral degree—for example, MD, DO, DDS (or their non-U.S. equivalents), PhD, SD, or other health-related degrees. Also eligible to apply are those with a master's degree in a health-related field (for example, MSN, MSW, MBA) and three years of relevant experience.

One-year (42.5 credit) master of science program Candidates normally hold a doctoral degree in medicine, dentistry, veterinary medicine, or other public health–related field. In rare cases applicants with significant professional experience may be considered.

Two-year (80-credit) master of science Candidates must hold a bachelor's degree in a relevant field; some work experience may also be required.

Master of occupational health Candidates must hold a doctoral degree in medicine.

Doctor of science Candidates must hold a bachelor's degree in a relevant field; some programs also require the completion of a prior master's or doctoral degree.

Doctor of public health Candidates must hold a doctoral degree in medicine, dental medicine, or veterinary medicine, or an advanced degree in a basic public health discipline; in addition, applicants must have, or be in progress toward, an MPH degree or its equivalent.

Schoolwide Degree Requirements

All HSPH degree programs require the completion of some course work intended to ensure basic competencies in public health sciences.

For all professional master's degree programs, students must fulfill core requirements in the following:

- biostatistics
- epidemiology
- environmental health sciences
- health services administration
- social and behavioral sciences

In addition, students must complete a culminating experience, demonstrating integration of public health knowledge, and/or a practice experience.

For research-oriented master's degree programs, students must fulfill the core requirements in biostatistics and epidemiology.

Students in HSPH doctoral programs must adhere to the doctoral timetable for maintaining satisfactory progress and must fulfill the following schoolwide requirements:

- completion of course work in one major field (20 credits) and two minor fields (10 credits each)
- courses in introductory epidemiology and intermediate biostatistics
- completion of the schoolwide oral qualifying examination, usually by the end of the second year (some departments also require a written qualifying examination)
- completion of a program of independent and original research in one of the basic disciplines of public health
- the presentation and submission of this research in a dissertation and the public defense of the dissertation
- payment of at least two years of full-time tuition and one year of full-time reduced tuition

Prospective students should consult the descriptions in this catalog for more information about particular programs and their specific admission and degree requirements. The Student Handbook, distributed during fall registration, also provides detailed information about requirements, timetables, and procedures. Additional application and enrollment information can be found on pages 60–61.

ROLAND MATSOUAKA

Doctoral student, Department of Biostatistics

Roland Matsouaka's long journey to Harvard began in his native country, the Republic of Congo. When civil war broke out in the Republic of Congo and damaged Marien Ngouabi University in Brazzaville, the country's capital, Roland had to leave his family behind to continue his mathematical studies in Burkina-Faso. After his funding was cut off, he got a scholarship in Benin and studied there for four years before spending a year as a research fellow at the Catholic University of Louvain-la-Neuve in Belgium. With two master's degrees in hand, and his determination to pursue doctoral training undiminished, Roland moved to the United States in 2003. He learned English, was accepted to HSPH as a master's student, and has now begun his PhD work at the school. Roland decided upon biostatistics because he wanted to apply his mathematical skills to public health problems: "Malaria is of great concern in my country. People sometimes get the disease two or three times a year. Because they are poor or the clinic is far away, often they seek treatment too late." In describing his HSPH experience, Roland says, "I find my professors more accessible than they were where I studied in Africa. I can ask them any question." Eventually Roland hopes to return to Africa to do data analysis for teams studying malaria and HIV.

DEPARTMENT OF BIOSTATISTICS

Biostatistics involves the theory and application of statistical science to analyze public health problems and to further biomedical research.

The faculty includes leaders in the development of statistical methods for clinical trials and observational studies, studies on the environment, and genomics/genetics. The department's research in statistical methods and interdisciplinary collaborations provide many opportunities for student participation.

Current departmental research on statistical and computing methods for observational studies and clinical trials includes survival analysis, missing-data problems, and causal inference. Other areas of investigation are environmental research (methods for longitudinal studies, analyses with incomplete data, and meta-analysis); statistical aspects of the study of AIDS and cancer; quantitative problems in health-risk analysis, technology assessment, and clinical decision making; statistical methodology in psychiatric research and in genetic studies; Bayesian statistics; statistical computing; statistical genetics and computational biology; and collaborative research activities with biomedical scientists in other Harvard-affiliated institutions.

Degree Programs in Biostatistics

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs and a doctor of philosophy (PhD) program. The PhD is offered under the aegis of the Harvard University Graduate School of Arts and Sciences.

Detailed information about requirements and elective options can be found in a handbook distributed by the department. A master of public health program in quantitative methods is described in the interdisciplinary section of this catalog.

The programs offered by the Department of Biostatistics provide rigorous training in the development of methodology, collaboration, teaching, and consultation on a broad spectrum of health-related problems. The department prepares students for academic and private-sector research careers. Recent graduates have assumed faculty posts at universities, as well as positions in research laboratories, federal government centers, pharmaceutical companies, and research institutes.

Applicants to the department should have successfully completed calculus through multivariable integration and at least one semester of linear algebra and have knowledge of a programming language. In addition, applicants are strongly encouraged to have completed courses in probability, statistics, advanced calculus, and numerical analysis. Practical knowledge of a statistical computing package such as SAS, Splus, R, Stata, or SPSS is also desirable.

Master of Science in Biostatistics (80-credit and 42.5-credit programs)

The master's degree programs offered by the department are aimed at students seeking a terminal master's degree. Students ultimately interested in a doctoral degree are encouraged to apply directly to the PhD program. For information about schoolwide requirements for master's degrees, see page 5.

Biostatistics offers training in statistical theory and a variety of methods commonly used in the field of biostatistics. For the 80-credit program 50 credits must be earned in courses from the master's core, which includes probability, statistical inference, statistical methods, linear and logistic regression, survival analysis, longitudinal analysis, clinical trials, statistical genetics, computational biology, health decision sciences, and related areas. Students also choose from a variety of elective courses.

The 42.5-credit program is designed for students who have a master's degree in one of the mathematical sciences or a doctorate in a quantitative field. Applicants must have a mathematical and statistical background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program. As courses must be taken out of sequence to complete the program in one year, considerable background in probability and statistical inference is needed. The requirements for this degree are essentially the same as for the 80-credit program. A minimum of 25 credits from the master's core must be completed, with courses chosen at an intermediate or advanced level. More flexibility is allowed since only 42.5 total credits are required. Other courses are selected in consultation with a faculty adviser.

Doctor of Philosophy in Biostatistics

The PhD program is designed for those who have demonstrated both interest and ability in scholarly research. Qualified applicants may apply to this program without a prior advanced degree. Please note that Graduate School of Arts and Sciences application forms must be used. The deadline for applying to the PhD program is December 15, 2007.

The course work for the PhD program is built on a 25-credit doctoral core. In addition, 30 credits of advanced biostatistics courses are required; these courses are chosen by the student in consultation with an adviser. Students must also complete a

10-credit cognate requirement (or minor) in a substantive area (such as the biology of cancer or AIDS). Given the increasing reliance of statistical practice on computing technology, one or more courses in statistical computing are also recommended. PhD students must satisfy a consulting requirement.

Funding is available to qualified students pursuing the PhD degree Most of the funding is through six biostatistics training grants in AIDS, cancer, computational biology, the environment, neurostatistics, and public health training for underrepresented minorities. These traineeships require U.S. citizenship or permanent residency. Other funding (for example, tuition scholarships and teaching and research assistantships) is awarded on a competitive basis to qualified applicants, including international students.

Related Offerings

Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
MPH concentration in quantitative methods, see page 55.

Contact Information

For more information about research and training in biostatistics, please contact David Wypij, director of graduate studies, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1056
Fax: 617-432-5619
Email: biostat_admissions@hsph.harvard.edu
Web: http://www.biostat.harvard.edu

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

The GSAS application in hard copy is available at the same web address.

For information on department funding, please consult http://www.biostat.harvard.edu/welcome/funding.html

For information on postdoctoral fellowships, please contact the Postdoctoral Committee, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-432-5619
Email: biostat_postdoc@hsph.harvard.edu
Web: http://www.biostat.harvard.edu/people/jobs.html#postdoctoral

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.harvard.edu/registrar/courses.

Introduction to Programming in SAS
Introduction to Data Management and Programming in SAS
Principles of Biostatistics—Introductory, I, and II
Introduction to Statistical Methods
Statistical Methods for Health and Social Policy
Statistics for Medical Research—Introductory, II, Advanced, and Translational
Analysis of Rates and Proportions
Regression and Analysis of Variance in Experimental Research
Survey Research Methods in Community Health
Applied Regression for Clinical Research
Principles of Clinical Trials
Basics of Statistical Inference
Applied Survival Analysis
Survival Methods in Clinical Research
Applied Longitudinal Analysis
Probability Theory and Applications I and II
Statistical Inference I and II
Methods I and II
Research Synthesis and Meta-Analysis of Public Health and Medicine
Regression and Analysis of Variance
Nonparametric Methods
Analysis of Failure Time Data
Analysis of Multivariate and Longitudinal Data
Design of Scientific Investigations
Advanced Statistical Computing
Bayesian Methods in Biostatistics
Advanced Statistical Genetics
Statistical Problems in Drug Development
Computational Methods for Categorical Data Analysis
Statistical Science Outreach
Statistical Computing Environments
Sequential Analysis
Computational Biology
Introduction to Computational Molecular Biology
Spatial Statistics for Health Research and Social Inquiry
Public Health Surveillance
Semiparametric Methods for Analysis of Missing and Censored Data
Reading the Medical Literature: A Course for Statisticians
Genomics and Genetics for Health Research
Statistical Methods for Causality
Linear and Longitudinal Regression
Introduction to Programming and Statistical Modeling in R
Introduction to Geographical Information Systems Using ArcGIS
Practice of Quantitative Methods
Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Louise M. Ryan, PhD; Henry Pickering Walcott Professor of Biostatistics. Rodent tumorigenicity experiments; teratology experiments; clinical trials; goodness-of-fit tests; survival analysis.

Rebecca A. Betensky, PhD; Professor of Biostatistics. Survival analysis; cancer genetics; latent class models; genetic epidemiology.

Tianxi Cai, SD; Associate Professor of Biostatistics. Survival analysis; robust model evaluation and selection; risk prediction and classification.

Paul J. Catalano, SD; Senior Lecturer on Biostatistics. Repeated measures, multivariate models; dose-response modeling; risk assessment; environmental statistics.

Brent A. Coull, MS, PhD; Associate Professor of Biostatistics. Categorical data analysis; generalized linear mixed models; generalized additive models.

Victor G. DeGruttola, SM, SM, SD; Professor of Biostatistics. Methods for analysis of repeated measures from longitudinal studies; design and analysis of AIDS clinical trials.

Gregory DiRienzo, MS, PhD; Assistant Professor of Biostatistics. Statistical methods arising in AIDS research; clinical trials; survival analysis; high-dimensional data; computing.

Robert J. Gray, MS, PhD; Professor of Biostatistics. Clinical trials; survival analysis; techniques for exploratory data analysis and model building.

David P. Harrington, MA, PhD; Professor of Biostatistics. Nonparametric methods for censored data; sequential designs for clinical trials.

Chengcheng Hu, MA, MS, PhD; Assistant Professor of Biostatistics. Failure-time data; measurement error; missing data; longitudinal data; clinical trials.

Michael D. Hughes, MSc, PhD; Professor of Biostatistics. Statistical methods in the design, analysis, and reporting of clinical trials; meta-analyses and diagnostic testing.

Hongyu Jiang, PhD; Assistant Professor of Biostatistics. Methodology for clinical trials and epidemiologic studies; multivariate survival analysis.

Peter Kraft, MA, MS, PhD; Assistant Professor of Epidemiology. Genetic epidemiology of complex diseases, especially cancer.

Stephen W. Lagakos, MPhil, PhD; Professor of Biostatistics. Statistical methods in AIDS research; clinical trials.

Nan M. Laird, PhD; Professor of Biostatistics. Longitudinal studies; nonresponse and missing-data methods; discrete data analysis; Bayesian methods.

Christoph Lange, MS, PhD; Assistant Professor of Biostatistics. Statistical methods in genetics; generalized linear models; robust statistics; time series analysis.

Cheng Li, PhD; Assistant Professor of Biostatistics. Computational biology and bioinformatics; gene expression and SNP microarray analysis methods and software.

Yi Li, MS, MS, PhD; Associate Professor of Biostatistics. Survival analysis; longitudinal and spatial data analysis.

Xihong Lin, MS, PhD; Professor of Biostatistics. Statistical methods for correlated data and high-dimensional data; nonparametric and semiparametric regression.

Xiaole (Shirley) Liu, PhD; Assistant Professor of Biostatistics. Computational genomics, especially sequence analysis and genome tiling; microarray analysis for the study of transcription regulation.

Judith J. Lok, MSc, PhD; Assistant Professor of Biostatistics. Causality; time-dependent confounding; counterfactuals; longitudinal data; observational studies; competing risks.

Donna S. Neuberg, MA, MS, SD; Senior Lecturer on Biostatistics. Cancer clinical trials; genetic epidemiology; high throughput data in cancer; laboratory and animal studies in cancer.

Christopher J. Paciorek, MS, PhD; Assistant Professor of Biostatistics. Bayesian statistics; spacial and spatio-temporal modeling; environmental applications.

Marcello Pagano, MS, PhD; Professor of Statistical Computing. Statistical computing; clinical trials; epidemic modeling.

John Quackenbush, MS, PhD; Professor of Computational Biology and Bioinformatics. Functional genomics; computational biology and bioinformatics; data integration.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Analytic methods for drawing causal inferences from complex observational and randomized studies.

Armin Schwartzman, MS, PhD; Assistant Professor of Biostatistics. Signal and image analysis with emphasis on mass spectrometry and diffusion tensor imaging data.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Binary data models with measurement error and misclassification in model covariates.

Kenneth E. Stanley, AM, PhD; Lecturer on Biostatistics. Design and evaluation of randomized clinical trials.

Marcia A. Testa, MPH, MPhil, PhD; Senior Lecturer on Biostatistics. Measurement and analysis of patient-reported outcomes; evaluation of public health preparedness.

Molin Wang, ME, PhD; Assistant Professor of Biostatistics. Estimation of functions; nuisance parameters; stratified, sparse, and clustered data; measurement of error.

James H. Ware, MS, PhD; Frederick Mosteller Professor of Biostatistics and Dean for Academic Affairs. Design and analysis of longitudinal studies.

Lee-Jen Wei, PhD; Professor of Biostatistics. Design and analysis of clinical trials; repeated measurements analysis; survival analysis.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Paige L. Williams, MS, PhD; Senior Lecturer on Biostatistics. Cancer risk assessment and other areas of environmental statistics; survival analysis; clinical trials; sequential monitoring; HIV/AIDS.

David Wypij, ScM, MS, MS, PhD; Senior Lecturer on Biostatistics. Longitudinal data analysis; repeated measures models, vaccine efficacy studies.

Guocheng (GC) Yuan, PhD; Assistant Professor of Computational Biology and Bioinformatics. Computational modeling of biological systems.

Marvin Zelen, MA, PhD; Professor of Statistical Science. Theory and practice of clinical trials; early detection of disease.

Secondary Appointments

(primary appointments at Harvard Medical School or Faculty of Arts and Sciences)

Roger B. Davis, MA, SD; Associate Professor in the Department of Biostatistics. Design and analysis of clinical trials; recursive partitioning methods.

Dianne M. Finkelstein, MS, PhD; Professor in the Department of Biostatistics. Survival analysis; clinical trials; epidemiology of cancer and AIDS.

Garrett Fitzmaurice, MSc, MA, SD; Associate Professor in the Department of Biostatistics. Likelihood and nonlikelihood approaches to analyzing multivariate binary outcomes.

Kimberlee Gauvreau, SM, SD; Assistant Professor in the Department of Biostatistics. Biostatistical issues in clinical studies in pediatric cardiology; institutional variability in outcomes after congenital heart disease surgery.

Richard D. Gelber, MS, PhD; Professor in the Department of Biostatistics. Design and analysis of clinical trials.

Rebecca S. Gelman, PhD; Associate Professor in the Department of Biostatistics. Clinical trials; disease screening; survival methods.

Robert J. Glynn, MA, PhD, SM, SD; Associate Professor in the Department of Biostatistics. Analysis of longitudinal data; nonresponse in sample surveys.

Nicholas T. Lange, MS, SD; Associate Professor in the Department of Biostatistics. Statistical methodology for human and animal brain mapping.

Jun Liu, PhD; Professor in the Department of Biostatistics. Genetics; computational biology; missing data; Bayesian methodology.

Sharon-Lise T. Normand, MSc, PhD; Professor in the Department of Biostatistics. Bayesian inference; graphical models; meta-analysis.

E. John Orav, PhD; Associate Professor in the Department of Biostatistics. Statistical computing and simulation; stochastic modeling; bioassay.

Bernard A. Rosner, MA, PhD; Professor in the Department of Biostatistics. Analysis of clustered binary data; longitudinal data analysis.

David A. Schoenfeld, MA, PhD; Professor in the Department of Biostatistics. Statistics in medical research; gene arrays; survival theory.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods; women's reproductive health.

Adjunct Faculty

Els Goetghebeur, MS, PhD. Ghent University, Belgium.

E. Andrés Houseman, SD. University of Massachusetts, Lowell

Mei-Ling Ting Lee, MS, MA, PhD. Ohio State University.

Cyrus R. Mehta, SM, PhD. Cytel Software Corporation.

Alexander J. Ozonoff, MA, PhD. Boston University School of Public Health.

Andrea Rotnitzky, MA, PhD. Di Tella University, Argentina.

Michael A. Stoto, AM, PhD. George Washington University.

Laura Forsberg White, SM, PhD. Boston University.

CHIUNG-YU CHANG

Master's student, Department of Environmental Health

Coming from a medical family, Chiung yu (Cali) Chang comments, "I see occupational safety and health as another form of medicine People often develop some kind of disability or disease related to their work." Cali majored in public health at Taipei Medical University, where she became interested in her current field. Until legislation to protect labor was passed, she explains, Taiwan was plagued by severely unsafe working conditions; even now, the country lacks sufficient data to monitor occupational diseases. After graduating from university, Cali worked in a laboratory at the Taiwanese Institute of Occupational Safety and Health on a project assessing the effects of cooking-oil fumes on restaurant workers. Encouraged by her supervisor, who had studied at HSPH, she applied to the master's program in occupational health in the Department of Environmental Health. Cali is still early on in her program, but she has been struck by the differences between the Taiwanese and American educational approach: "The emphasis here is on your core knowledge rather than your grades." She describes the students as "competitive in a good way. They are very helpful and make me work harder." Cali will spend the summer in the lab of her adviser, Professor David Christiani. She plans to apply to the HSPH doctoral program in environmental health.

DEPARTMENT OF ENVIRONMENTAL HEALTH

The mission of the Department of Environmental Health is to advance the health of all people in the United States and around the world through research and training in environmental health. The department emphasizes the role of air, water, the built environment, and the workplace as critical determinants of health.

Faculty members in the department study the pathogenesis and prevention of environmentally produced illnesses and act as catalysts for scientifically based public health advances. Research approaches range from the molecular to the epidemiologic.

The Department of Environmental Health focuses on complex problems that require the contributions of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, applied mathematicians, physicians, occupational health nurses, physiologists, cell biologists, molecular biologists, and microbiologists. Educational activities of the department are carried out through three concentrations:

- exposure, epidemiology, and risk
- occupational health
- molecular and integrative physiological sciences

EXPOSURE, EPIDEMIOLOGY, AND RISK

The focus of research and educational training in exposure, epidemiology, and risk (EER) is the investigation and mitigation of health risks associated with environmental and occupational hazards. These environmental challenges to our society are addressed by EER through an interdisciplinary approach, involving the characterization of contaminant sources, hazards, and environmental transport, identification of routes of exposure, investigation of health effects, and the employment of risk assessment, engineering, and management strategies to minimize adverse outcomes.

Faculty members focus their research, and students acquire core competencies, in three domains:

- exposure, which emphasizes the chemical, physical, microbiological, and engineering aspects of environmental and occupational exposures. Faculty members study the transport and fate of environmental contaminants by measurement and modeling of ambient, indoor, and personal exposures to environmental and workplace contaminants and hazards. They also develop instruments and methods for collecting, analyzing, and assessing the effects of physical, chemical, and biological stressors.

- epidemiology, which focuses on identifying and measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies.

- risk assessment, involving the integration of evidence from exposure assessment, epidemiology, toxicology, and other disciplines to inform policy decisions in the presence of uncertainty. Faculty members are involved in research and training on analytic methods and applications to quantify human health risks.

In addition, students specialize in one or more of the areas of interest described below:

Environmental epidemiology This area of interest is for students interested in measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies.

Ergonomics and safety This area of interest provides a public health and engineering approach to the prevention of work-related injuries and musculoskeletal disorders. The area encompasses exposure assessment, occupational biomechanics, and epidemiology.

Exposure assessment This area of interest prepares students to identify and characterize human and ecological exposures to environmental contaminants, model their fate and transport, and develop strategies to control environmental hazards, allergens, and pathogens.

Industrial hygiene This area of interest offers training in the anticipation, identification, evaluation, and control of occupational hazards.

Risk assessment This area of interest provides an integrated education in environmental science, risk analysis, and decision science applied to environmental management.

Degree Programs in Exposure, Epidemiology, and Risk

EER offers both 80-credit and 42.5-credit master of science (SM) programs in environmental health, including the 80-credit SM in industrial hygiene, as well as a program leading to the doctor of science (SD) degree.

All students must meet the school requirements for core knowledge in public health (for information about schoolwide requirements for master's and doctoral students, see page 5). In addition, both doctoral and master's students in this concentration take core courses in human physiology and toxicology, exposure assessment, environmental and occupational epidemiology, and risk assessment. Beyond the general core requirements, areas of interest have specific course requirements. Advanced courses in exposure, epidemiology, and risk are oriented toward specific pollutants or media (such as air or water). They may focus on monitoring, modeling, or the control of pollutants; health effects; or management, regulation, and policy.

Many students also take courses at MIT and at other Harvard schools, including the Kennedy School of Government and the Faculty of Arts and Sciences.

Master of Science in Environmental Health (80-credit and 42.5-credit programs)

Graduates of these professional programs assume positions in government, in private companies, or in research institutions. In the past few years some graduates have gone to work as scientists in environmental consulting firms, as industrial hygienists, or as academic and government researchers. Some are working for nonprofit community and international organizations, while others have gone on to pursue doctoral programs.

Applicants' personal statements should clearly state their preferred area of interest within the exposure, epidemiology, and risk concentration and the ways that the program will further their careers.

Applicants to the 80-credit program generally have undergraduate degrees and limited work experience. Consistent with the interdisciplinary nature of the concentration, a broad range of undergraduate or graduate degrees are acceptable. Among these are environmental science, physics, mathematics, biology, chemistry, engineering, geology, meteorology, and decision analysis. Applicants to the program are expected to have evidence of strong quantitative skills. Occasionally applicants with social science, business, or policy backgrounds are successful if they can demonstrate some academic background in math, chemistry, and biology. At times applicants are accepted conditional upon completing science and/or math courses.

The EER 80-credit master's programs are based on a set of core courses in the first two semesters, followed by more specialized courses in the later semesters. Within these constraints students have some flexibility to change their focus within the program. Students enrolled in the 80-credit program in industrial hygiene follow the same general curriculum and may also elect a focus in hazardous substances, which involves several additional targeted courses and a related internship.

Applicants with exceptional credentials (including postbaccalaureate degrees and/or professional experience) may request consideration for admission to a 42.5-credit SM program.

Within the 42.5 master's program an area of interest in **environmental health management** is available for midcareer environmental health professionals from developing countries interested in updating and strengthening their knowledge and technical capabilities. The program stresses the scientific foundations and quantitative/analytic skills needed to frame, develop, and manage environmental health policy. Topics of study include exposure and risk assessment, epidemiology and toxicology, environmental economics and decision analysis, life cycle assessment, and negotiation analysis.

Doctor of Science in Environmental Health

Doctoral graduates are qualified for research and teaching positions in schools of public health and other academic institutions, in local and federal agencies, and in the private sector. Recent graduates have taken positions as faculty members; as research scientists with the Environmental Protection Agency, the National Institute for Occupational Safety and Health (NIOSH), the environmental division of Health Canada, and Taiwan's Institute of Occupational Health and Safety; and as staff scientists with the National Research Council, the Mexican Ministry of Health, and consulting organizations.

Applicants to the doctoral program normally have a master's degree in a related science or mathematics field and strong scientific and quantitative skills. Admission into the doctoral program in all areas of interest depends upon demonstrated competence in the requirements for an SM program described above. Those applying to study industrial hygiene usually have several years of relevant work experience in addition to a master's degree.

Doctoral students interested in a research career in environmental epidemiology are encouraged to consider a dual degree in environmental health and epidemiology (see page 19). Doctoral students with a strong interest in both environmental science and methodological aspects of the decision sciences are encouraged to apply to the **environmental science and risk management** area of interest. This program involves admission to both the Department of Environmental Health and the Department of Health Policy and Management and requires a double major. Students uncertain about whether their interests are better suited to one of these joint programs or to another program in exposure, epidemiology, and risk should contact the EER office for clarification.

Doctoral candidates are provided training in teaching and oral presentation. They serve as teaching assistants and are also expected to present their research in departmental seminars. During the course of their program, doctoral students are encouraged to present papers at scientific conferences.

Depending on the specialty area, doctoral students may be funded either fully or partially through research or training-grant fellowships. National Institutes of Health (NIH) traineeships are restricted to doctoral students who are U.S. citizens or permanent residents. For students specializing in industrial hygiene, tuition support may be available through a NIOSH Education and Research Center Grant for highly qualified U.S. citizens.

Contact Information

For more information about research and training in exposure, epidemiology, and risk, please contact the EER Program Office at HSPH Landmark Center, Box 15677, 401 Park Drive West, Boston, MA 02215, or visit the EER website.

Applicants to the doctoral program are strongly encouraged to arrange an interview with faculty members. Please contact the EER program office at the address above or via email.
Email: envsci@hsph.harvard.edu
Web: http://www.hsph.harvard.edu.eer

OCCUPATIONAL HEALTH

This occupational health concentration is designed to train health and safety professionals to recognize and prevent disease and injuries associated with occupational and environmental exposures. This concentration is offered by the environmental and occupational medicine and epidemiology research program (EOME). The disciplines of medicine and epidemiology are the focus of the EOME program; depending on the orientation of the student, these disciplines are brought to bear on occupationally and environmentally related exposures. Practicing physicians and nurses can choose courses with a medical orientation; industrial hygienists, safety professionals, and those seeking careers in academia and research can emphasize epidemiology. The academic degree programs listed below are organized so that students can chose courses in both medicine and epidemiology.

Faculty research is focused on a wide variety of exposures and research approaches to identifying the association between exposure and disease or injury. Areas of faculty research include the following:

- respiratory disease among exposed populations, including indoor and outdoor workers and building occupants
- reproductive and chronic disease studies of populations exposed to petrochemicals, heavy metals, and persistent organic compounds
- biological and chemical hazards assessment
- epidemiology of acute injury and cumulative trauma disorders
- occupational and environmental cancers, such as lung, skin, and bladder cancer
- biomonitoring and medical surveillance
- occupational and environmental health focused on developing countries
- occupational health policy and services
- population genetics, including the development of biochemical, molecular, and genetic markers and their applications in epidemiologic studies
- environmental and molecular epidemiology and occupational epidemiology
- gene-environment interactions

Degree Programs in Occupational Health

The training programs in occupational health are offered through the NIOSH-sponsored Harvard Education and Research Center for Occupational Safety and Health (ERC). Graduates are prepared for careers in fields such as occupational and environmental medicine and nursing, industrial hygiene, occupational and/or environmental safety, epidemiologic research, disease and injury surveillance, environmental and/or occupational health policy, and molecular epidemiology.

As described below, the following programs are offered: master of occupational health (MOH); master of science (SM) in primary health care nursing (from Simmons College) and dual-degree SM in environmental health and primary health care nursing (from HSPH, in cooperation with Simmons College); SM in environmental health with a focus on occupational safety and health; and doctor of science (SD) or doctor of public health (DPH). For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Occupational Health (42.5-credit program)

This professional program is designed to train physicians in the public health disciplines relevant to the prevention and control of occupational and environmental disease and injury. Physicians interested in occupational and environmental medicine may apply either to the MOH program or to the occupational and environmental health concentration of the master of public health (MPH) program. Either the MOH or the MPH is taken as the first year of a two-year Occupational and Environmental Medicine Residency (see page 14).

For the MOH (or the MPH) program, in addition to schoolwide requirements, students take core courses in toxicology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, occupational and environmental medicine, environmental and occupational epidemiology, and the practice of occupational health. Recommended electives include the analysis of rates and proportions, regression and analysis of variance in experimental research, and the ethical basis of the practice of public health.

Master of Science in Environmental Health (80-credit and 42.5-credit programs)

The occupational health concentration emphasizes the epidemiologic and biostatistical aspects of the environmental and occupational fields. The SM is normally an 80-credit program, although an individual with a PhD or JD may be admitted to a 42.5-credit program. It is generally expected that

students without a prior doctoral degree will wish to enroll in a subsequent doctoral program.

This program provides training appropriate for those who wish to work in research or teaching environments. Applicants normally have a bachelor's degree and advanced training in science, including college-level organic and inorganic chemistry. Those currently holding positions in the fields of occupational or environmental safety and health and planning to return to these positions are considered particularly strong candidates for admission.

In addition to schoolwide requirements, students take courses in toxicology, pathophysiology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, environmental and occupational epidemiology, the practice of occupational health, advanced biostatistics, and ethics.

Master of Science in Primary Health Care Nursing (42.5-credit program)

This program is offered by the Harvard Education and Research Center and Simmons College, which awards the degree. The program is designed for registered nurses seeking preparation as occupational health nurse practitioners.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of basic statistics and physical assessment courses, and must be registered to practice nursing in a U.S. state or territory.

Participants undertake practica in industrial settings, clinics, and hospital-based occupational health programs and complete a course at HSPH in occupational health policy and administration and courses at Simmons College in normal and abnormal human physiology, research methods, the theory and practice of primary health care nursing, the theoretical foundations for nursing practice, clinical pharmacology for nurses in ambulatory care, health in the workplace, health care systems, and health promotion.

Master of Science in Environmental Health (HSPH) and Primary Health Care Nursing (Simmons College) (dual-degree, 80-credit program)

This dual-degree professional program emphasizes identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. The program integrates curricula from HSPH and Simmons College, with courses taken concurrently at these institutions.

The program focusing on occupational health nursing is also aimed at preparing nurses for positions as occupational health nurse practitioners. Practice locations include workplaces/corporations, clinics (including occupational and environmental medicine facilities), and hospitals.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of a basic statistics course, and must be registered to practice nursing in a U.S. state or territory. Nurses interested in this program must apply to, be accepted by, and maintain satisfactory academic progress in both schools.

Students in this program must fulfill essentially the same course requirements at Simmons College as those enrolled in the master of science in primary health care nursing (see above). At HSPH, in addition to schoolwide requirements, students take courses covering ergonomics and human factors, the work environment, occupational safety, and environmental and occupational epidemiology; a tutorial in toxicology; and two electives. Students must also complete an independent study project.

Doctor of Science in Environmental Health/Doctor of Public Health

The SD or DPH degree may be earned by students who wish to concentrate in occupational health. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

In addition to schoolwide requirements, students in the doctoral program complete many of the same courses as those in the SM program and also courses in exposure assessment for epidemiology, biomarkers in chronic disease, and advanced epidemiology.

Some financial support may be available for doctoral students who are U.S. citizens or permanent residents through NIH National Research Service Awards, NIOSH-sponsored ERC or other traineeships, or scholarships.

Occupational and Environmental Medicine Residency

The residency is a two-year program consisting of an academic year leading to the MPH or MOH degree and a practicum year devoted to the development of skills in clinical occupational and environmental medicine and epidemiologic research. During the practicum year acquired knowledge and skills are applied to patient management and workplace/environmental community problem solving; at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital- and community-based occupational and environmental health clinics. Additional rotation choices are available in corporate medical departments and governmental agencies. The residency is fully accredited by the Accreditation Council for Graduate Medical Education.

Applicants must be graduates of an approved school of medicine or osteopathy and must have completed at least one year of internship training in an accredited U.S. or Canadian clinical program; board eligibility or certification in a primary care specialty is preferred. Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered strong candidates for admission.

In addition to submitting an application to the degree program, prospective residents must send a letter of interest to the Occupational and Environmental Medicine Residency program, enclosing a curriculum vitae listing medical training and experience, research experience, and publications. Admission to the practicum year of the residency is a separate process from, and usually occurs shortly after, admission to the degree program.

Applicants to the MOH program and the MPH program with a concentration in occupational and environmental health who are also applying to the Occupational and Environmental Medicine Residency program must apply for both the degree program and the residency by October 1, 2007, for 2008–09 matriculation. Continuation into

the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the academic phase of the program.

Some financial support for residency candidates who are U.S. citizens or permanent residents may be available through traineeships.

Related Offerings

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 19.
MPH concentration in occupational and environmental health, see page 55.

Contact Information

For more information about the occupational health concentration, MOH degree program, training in occupational epidemiology, and ERC traineeships, please contact David C. Christiani, MD, MPH, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115, or visit the ERC website.
Phone: 617-432-1260
Fax: 617-432-3441
Email: dchris@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc

For more information about the Occupational and Environmental Medicine Residency, please contact Stefanos Kales, MD, MPH, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3327
Fax: 617-432-0219
Email: skales@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc/oemr/index.htm

MOLECULAR AND INTEGRATIVE PHYSIOLOGICAL SCIENCES

Training in molecular and integrative physiological sciences (MIPS) addresses the intersection between basic pulmonary sciences and environmental exposures, often in the context of global public health. Faculty members focus on three main problems: air pollution, lung infection, and asthma. The theme of pulmonary inflammation spans these foci, as does an interdisciplinary approach bridging biological and physical sciences. Areas of research include biomechanical properties of cells/tissue in normal/inflamed lungs; smooth muscle and airway constriction in asthma; mediators and adhesion molecules involved in pulmonary inflammation; effects of inhaled particles; lung infections; control of breathing in humans; sleep-related breathing disorders; respiratory sensations; and epithelial cell, macrophage, lymphocyte, and neutrophil lung biology. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

The MIPS concentration combines a range of scientific fields, including physics, bioengineering, physiology, biomathematics, cell biology, molecular biology, proteomics and genomics, clinical science, and epidemiology. By working within this rich interdisciplinary environment, students learn many measurement technologies, discover a variety of approaches, and develop mature scientific thinking.

Degree Programs in Molecular and Integrative Physiological Sciences

As described below, the MIPS concentration leads either to the doctor of science (SD) degree, offered through the Department of Environmental Health, or to the doctor of philosophy (PhD) degree, offered through the Division of Biological Sciences.

Doctor of Science in Environmental Health

Students wishing to study cellular, integrative, or engineering approaches as they pertain to problems in the environment, physiology, or public health may apply directly to the SD program in the Department of Environmental Health.

The SD program prepares students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. Graduates assume positions as faculty members and research scientists at medical schools, research institutes, and schools of public health. Career opportunities in molecular and integrative physiological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Students in this program follow a different curriculum from those in the PhD program. In consultation with their adviser, students design a program of course work with their specific objectives in mind. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics, and provides the opportunity for students to engage in laboratory rotations. For information about schoolwide requirements for doctoral degrees, see page 5.

Most students admitted to the SD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends.

Doctor of Philosophy in Biological Sciences in Public Health (Molecular and Integrative Physiological Sciences)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health may apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. For more information about the PhD program, see page 57.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard. edu/registrar/courses.

Introduction to Environmental Health
Principles of Environmental Health
Human Physiology
Advanced Respiratory Physiology
Advanced Topics in Physiology
Occupational Health Policy and Administration
Introduction to Occupational and Environmental Medicine
Epidemiology of Environmental and Occupational Health Regulations
Occupational Safety and Injury Prevention
Ergonomics/Human Factors
Protecting Workers and Communities from Hazardous Substances
Ventilation
Evaluation and Control of Noise and Vibration
Introduction to Aerobiology
Water Pollution
Introduction to the Work Environment
Analytical Methodology and Exposure Assessment
Water Systems Management
Industrial Hygiene/Ergonomics Internships and Environmental Sciences Research Seminar
Exposure Assessment for Environmental and Occupational Epidemiology
Environment Risk Management
Genetic Epidemiology and Gene-Mapping
Human Health and Global Environmental Change
Radiation Environment: Identification, Evaluation, and Control
Field Methods in Environmental Health
Occupational Health Care Delivery
Injury Epidemiology and Prevention
Industrial Ecology and Life Cycle Assessment
Research in Physiology
Properties and Behavior of Airborne Particles
Air Pollution and Energy Processes
Occupational Biomechanics
Atmospheric Environment Seminars
Principles of Toxicology
Advanced Seminar in Aerobiology
Environmental Exposure, Epidemiology, and Risk Practicum
Fundamentals of Human Environmental Exposure Assessment
Interdisciplinary Training in Pulmonary Sciences I and II
Critical Readings in Mechanisms of Health Effects by Air Pollution
Environmental Genetics
Ecotoxicology
Environmental and Occupational Epidemiology
Practice of Occupational Health
Respiratory Epidemiology
Advanced Regression for Environmental Epidemiology
Integrated Cancer Biology
Risk Assessment
Independent Research, Tutorials

Contact Information

For more information about research and training in molecular and integrative physiological sciences or about the SD program, please contact Lester Kobzik, MD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2247
Fax: 617-432-0014
Email: lkobzik@hsph.harvard.edu

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

The GSAS application in hard copy is available at the same web address.

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

Joseph D. Brain, SM, SM, SD; Cecil K. and Philip Drinker Professor of Environmental Physiology. Function and structure of pulmonary macrophages; deposition and clearance of inhaled particles and responses to them; respiratory infection; metal bioavailability.

James P. Butler, AM, PhD; Senior Lecturer on Physiology. Lung structure and function; parenchymal micromechanics; magnetic twisting cytometry; nemoendocrinology; avian physiology.

David C. Christiani, MD, MPH, SM; Professor of Occupational Medicine and Epidemiology. Occupational and environmental diseases; gene-environment interactions; biomarkers and molecular epidemiology.

Philip K. Demokritou, MEng, PhD; Assistant Professor of Aerosol Physics. Development of human exposure measurement techniques; sources, transport, and fate of air pollutants in the built environment.

Jack T. Dennerlein, SM, PhD; Associate Professor of Ergonomics and Safety. Work-related chronic musculoskeletal disorders; design of human-machine interfaces.

John S. Evans, MS, SM, SD; Senior Lecturer on Environmental Science. Environmental decision making; uncertainty in estimates of exposure; dose response and risk; value of information; health impacts of the 1991 Kuwait oil fires and Iraq's 1990 invasion of Kuwait.

Majid Ezzati, MEng, MA, PhD; Associate Professor of International Health. Environmental health in developing countries; energy, air pollution, and health; risk assessment; population health; global health; technology policy.

Jeffrey J. Fredberg, SMME, ME, PhD; Professor of Bioengineering and Physiology. Identification of the mechanical basis of airway and lung parenchymal function at the levels of organ, tissue, cell, and protein.

Beatriz S. González-Flecha, MS, PhD; Associate Professor of Molecular Biology and Environmental Health. Biochemistry of oxygen free radicals; oxidative stress in biological systems; mechanisms of oxidative damage in eukaryotic and prokaryotic cells.

Russ B. Hauser, MD, MPH, SD; Associate Professor of Environmental and Occupational Epidemiology. Reproductive and developmental epidemiology; impact of endocrine disruptors on fertility and pregnancy outcomes; contaminants.

Robert F. Herrick, MS, SD; Senior Lecturer on Industrial Hygiene. Characterization of complex exposures; interaction of individuals with a source of exposure; biomarkers of exposure and early response and damage.

Karl T. Kelsey, MD, MOH; Professor of Cancer Biology and Environmental Health. Exposure-related cancers; epigenetics; molecular epidemiology and gene-environment interaction.

Petros Koutrakis, MS, PhD; Professor of Environmental Sciences. Sampling and analysis of air pollutants; atmospheric, indoor air, and aerosol chemistry; application of multivariate techniques to source apportionment; acid rain; urban air pollution.

Francine Laden, MS, SD; Assistant Professor of Environmental Epidemiology. Environmental epidemiology of cancer and respiratory disease; refining methods for exposure assessment in large epidemiologic cohorts.

Jonathan I. Levy, SD; Mark and Catherine Winkler Associate Professor of Environmental Health and Risk Assessment. Health impacts of power plants and transportation; air pollution exposure assessment and risk assessment; environmental equity; indoor air quality.

Nancy C. Long Sieber, PhD; Lecturer on Physiology. Mechanisms of pulmonary inflammation, particularly interactions between lung infection and air pollution.

Quan Lu, MS, PhD; Assistant Professor of Lung Biology. Protein trafficking and receptor signaling; cellular entry and transport of pathogens and environmental toxins; development of functional genetic tools.

Joseph P. Mizgerd, SD; Associate Professor of Physiology and Cell Biology. Lung infections, innate immunity, and the regulation and significance of cytokine signaling.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology. Relationship between the workplace, the environment, and disease.

Melissa Perry, MHS, ScD; Associate Professor of Occupational Epidemiology. Occupational epidemiology and prevention; pesticide exposures and health effects; traumatic injuries in high-risk industries.

Stephen N. Rudnick, MS, SM, SD; Lecturer on Industrial Hygiene Engineering. Engineering control of microbiological and particulate air contaminants in indoor and occupational settings; engineering control systems.

Joel D. Schwartz, PhD; Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

James P. Shine, PhD; Associate Professor of Aquatic Chemistry. Distribution, fate, and effects of contaminants in aquatic ecosystems; influence of environmental variables on routes of exposure to toxic substances.

Stephanie A. Shore, PhD; Senior Lecturer on Physiology. Pathogenesis of asthma, especially the relationship between obesity and asthma, and in airway smooth-muscle biology.

Thomas J. Smith, MPH, MS, PhD; Professor of Industrial Hygiene. Evaluation of exposure-response relationships through occupational epidemiologic studies; application of pharmacokinetic modeling to exposure-tissue dose relationships.

Frank E. Speizer, MD; Professor of Environmental Science. Environmental epidemiology; pulmonary diseases; cancer and nutrition; health effects of air pollution; occupational and environmental medicine

John D. Spengler, PhD, SM; Akira Yamaguchi Professor of Environmental Health and Human Habitation. Sustainability; green buildings; health and the built environment; exposures to environmental contaminants in indoor and outdoor environments.

Helen H. Suh, SM, SD; Associate Professor of Environmental Chemistry and Exposure Assessment. Exposure assessment; air pollution and cardiovascular health; exposure modeling; indoor air quality; particulate matter.

Daniel J. Tschumperlin, MS, PhD; Assistant Professor of Bioengineering and Airway Biology. Remodeling of the lung and implications in lung diseases; transduction of physical forces at a cellular and molecular level.

Marc G. Weisskopf, PhD, SM, SD; Mark and Catherine Winkler Assistant Professor of Environmental and Occupational Epidemiology. Neuroepidemiology; neurotoxicology; physiologically based methods for assessing neurologic function.

Xin Xu, MD, PhD; Mark and Catherine Winkler Assistant Professor of Genetic Epidemiology. Genetic epidemiology of complex traits in humans, with specific reference to asthma and hypertension; statistical methods and tools; bioinformatics.

Secondary Appointments

(primary appointments at Harvard Medical School)

David C. Bellinger, PhD, SM, Professor in the Department of Environmental Health. Developmental impact of early metabolic and chemical insults to the nervous system; neuropsychological toxicology.

Jeffrey M. Drazen, MD; Professor in the Department of Environmental Health. Pulmonary and respiratory pharmacology; mediators of immediate hypersensitivity; mucus regulation and expression in chronic bronchitis.

John J. Godleski, MD; Associate Professor in the Department of Environmental Health. Experimental models of normal and pathologic responses to inhaled particles.

Diane R. Gold, MD, MPH; Associate Professor in the Department of Environmental Health. Acute lower-respiratory illness in childhood as a predictor of lung function and chronic respiratory symptoms; air pollution and childhood respiratory morbidity.

Rose H. Goldman, MD, MPH, SM; Associate Professor in the Department of Environmental Health. Metal poisoning and toxicity; neurotoxicity; repetitive strain injuries, medical and public health education.

Stefanos (Stephen) N. Kales, MD, MPH; Assistant Professor in the Department of Environmental Health. Occupational and environmental lung disease; occupational and environmental toxicology.

Jeffrey N. Katz, SM, MD; Associate Professor in the Departments of Environmental Health and Health Policy and Management. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions, back pain and upper-extremity disorders.

Lester Kobzik, MD; Professor in the Department of Environmental Health. Lung defenses against inhaled particles and pathogens; pulmonary inflammation and pathology.

Christos S. Mantzoros, MD, DSc, MMSc, SM; Associate Professor in the Department of Environmental Health. Obesity, diabetes, and malignancies; biomarkers, molecular epidemiology, and translational research.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobacterium tuberculosis*, air disinfection with ultraviolet irradiation.

Richard L. Verrier, PhD; Associate Professor in the Department of Environmental Health. Neural triggers of sudden cardiac death; cardiac electrophysiology; T-wave alternans; coronary hemodynamic function; novel delivery systems for anti-arrhythmic therapy.

Scott T. Weiss, MD, SM; Professor in the Department of Environmental Health. Natural history of chronic lung disease; epidemiology of asthma and hypertension; cardiovascular, occupational, environmental, and genetic epidemiology.

Robert O. Wright, MD, MPH. Assistant Professor in the Department of Environmental Health. Pediatric environmental health; gene-environmental interactions, psychosocial factors as modifiers of chemical neurotoxicants.

Adjunct Faculty

Christos C. Anastasiou, ME, PhD. Cyprus International Institute for the Environment and Public Health.

Deborah H. Bennett, MS, PhD. University of California, Davis.

Harriet A. Burge, MA, PhD. Environmental Microbiology Laboratory.

Costas A. Christophi, MS, PhD. Cyprus International Institute for the Environment and Public Health.

Ellen A. Eisen, SM, SM, SD. University of California, Berkeley.

Alan Eschenroeder, PhD. Alanova, Inc.

Philippe Grandjean, MD, DMSc. Odense University, Denmark.

Steven R. Hanna, MS, PhD. Hanna Consultants.

Howard Hu, MD, MPH, SM, SD. University of Michigan.

Tom B. Leamon, MSc, MSc, PhD. Liberty Mutual Research Institute for Safety.

Edward F. Maher, MS, SD. Dade Moeller & Associates.

Donald K. Milton, MD, MPH, DPH. University of Massachusetts, Lowell.

Heather H. Nelson, MPH, PhD. University of Minnesota.

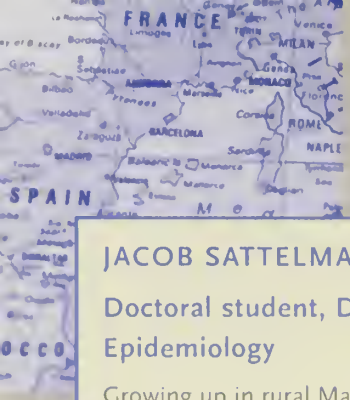
Robert B. Pojasek, PhD. Pojasek & Associates.

Christine A. Rogers, PhD. University of Massachusetts, Amherst.

Elpidoforos S. Soteriades, MD, SM, SD. Cyprus International Institute for the Environment and Public Health.

Gregory R. Wagner, MD. National Institute for Occupational Safety and Health.

David H. Wegman, MD, SM. University of Massachusetts, Lowell.



JACOB SATTELMAIR

Doctoral student, Department of Epidemiology

Growing up in rural Massachusetts, and encouraged by his parents to be outside and active, Jacob Sattelmair realized early on that exercise made him feel better. That realization has become the foundation of his present studies and plans for the future. As a Harvard undergraduate, Jake rowed competitively and majored in neurobiology. "I always leaned toward the behavioral side of neurobiology—why people do what they do," he remarks. At Oxford he continued competitive rowing while pursuing a master's degree in the science and medicine of athletic performance; for his thesis research Jake conducted a review of the literature on the link between exercise and cognitive function. "It gradually became clear to me that physical inactivity was a really big problem, that it was getting worse, and that we needed to do something about it," he says. Jake applied to three bench-science programs but choose to pursue a doctorate in epidemiology at HSPH: "I wanted to apply science to help people's lives." Down the road Jake hopes to combine research with the development of self-sustaining corporate and school-based exercise programs. In the meantime he is helping to create interactive video games. Jake notes, "Using media and technology to promote health behaviors is a great social enterprise."

DEPARTMENT OF EPIDEMIOLOGY

Epidemiology—the study of the frequency, distribution, and determinants of disease in humans—is a fundamental science of public health. Epidemiologists use many approaches, but the ultimate aim of epidemiologic research is the prevention or effective control of human disease.

The Department of Epidemiology has a long tradition of teaching and research, including in the epidemiology of cancer, cardiovascular, and other chronic diseases, and infectious diseases, as well as in epidemiologic methodology. Current research in the department includes the role of viruses in the etiology of cancer; the connection between diet and risk of cancer, cardiovascular disease, and other major chronic diseases; the relationship between exposure to chemicals in the workplace and the development of cancer; the epidemiology of infectious disease; factors in early life predisposing individuals to chronic diseases; case identification and risk factors in mental disorders; health effects of drugs, vaccines, and medical devices; and causes of human infertility.

Degree Programs in Epidemiology

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, as well as a doctor of science (SD) and doctor of public health (DPH) program. For information about schoolwide requirements for master's and doctoral programs, see page 5.

Students in all degree programs choose from among fourteen areas of interest:

Cancer epidemiology In addition to research methodology, the curriculum in this area includes courses on the biology and genetics of cancer; the basic concepts and issues of cancer epidemiology; the roles of lifestyle factors such as diet and physical activity, oncogenic viruses, and occupational exposures in the etiology of cancer; the integration of biomarkers into research; the prevention of cancer; and research methods. Research opportunities for students include a large number of ongoing cohort and case-control studies within the department and in conjunction with the Dana-Farber/Harvard Cancer Center.

Cardiovascular epidemiology This area provides training in research methodology and the epidemiology of cardiovascular diseases. Doctoral students conduct research in a substantive or methodological area related to cardiovascular epidemiology. Research opportunities for graduate and postdoctoral students include a broad area of topics, including the role of diet, genetics, plasma markers, lifestyle characteristics, clinical interventions, and environmental predictors of primary and secondary onset of cardiovascular disease. Trainees will have the opportunity to work with several large ongoing cohort and case-crossover studies and to interact with other departments with active cardiovascular research programs.

Clinical epidemiology This area is designed primarily for clinicians and other health care professionals who wish to develop the quantitative skills needed for clinical research. Students take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics of potential interest such as health status and quality-of-life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

While the appropriate content for this area may be covered by taking courses offered during the regular academic year (fall and spring semesters), requirements for the 42.5-credit SM degree in epidemiology may also be partially fulfilled by taking the summer courses offered through the Summer Program in Clinical Effectiveness and the Summer Session in Public Health Studies. In this schedule students begin their program by taking a core set of courses during an initial summer period. They complete the SM program by taking advanced courses during the regular academic year and, if desired, during a second summer period. Alternatively, students who only take courses during two summer periods can satisfy the requirements for the 42.5-credit SM degree by completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manuscript of quality suitable for publication. An outline for this project must be submitted at the time of application.

Environmental/occupational epidemiology This area is closely associated with the concentrations in exposure, epidemiology, and risk and in occupational health in the Department of Environmental Health. Students take courses in epidemiology, environmental health, occupational health, biostatistics, toxicology, genetics, and environmental exposure assessment. Doctoral students conduct research in a substantive or methodologic area related to environmental or occupational health. Research emphasis includes the relationships between environmental and occupational exposures and cancer, children's health, cardiopulmonary disease, neurodegenerative disease, reproductive health, and gene-environment interactions.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Principles of Epidemiology
Introduction to Epidemiology
Elements of Epidemiologic Research
Study Design in Epidemiologic Research
Analysis of Case-Control and Cohort Studies
Practice of Epidemiology
Advanced Epidemiologic Methods
Introduction to Clinical Epidemiology
Epidemiology of Cancer
Epidemiology in Public Health Practice
Assessment Concepts and Methods in Psychiatric Epidemiology
Pharmacoepidemiology—Introductory and Advanced
Genetic Epidemiology of Diabetes and Its Complications
Cardiovascular Epidemiology
Cancer Prevention
Oral Epidemiology
Ophthalmic Epidemiology
Research Synthesis and Meta-Analysis
Epidemiologic Methods in Health Services Research
Analytical Aspects of Clinical Epidemiology
Use of Biomarkers in Epidemiologic Research
Measuring Health Status
Seminar in Applied Research in Clinical Epidemiology
Genetic Epidemiologic Methods for Psychiatric and Other Disorders
Applied Biomarkers in Cancer Epidemiology
Epidemiologic Methods Development—Past and Present
Molecular Biology for Epidemiologists
Molecular Epidemiology of Cancer
Studies in Molecular Epidemiology
Infections and Cancer
Epidemiology of Aging
Epidemiology of HIV Infection I: Etiology, Natural History, and Transmission
Epidemiology of HIV Infection II: Therapeutic and Prevention Interventions
Advanced Seminar in Cancer Epidemiology
Mathematical Modeling of Infectious Diseases
Epidemiologic Research in Obstetrics and Gynecology
Advanced Reproductive Epidemiology
Propensity Score Analysis: Theoretical and Practical Considerations
Epidemiology of Neurologic Diseases
Infectious Disease Dynamics
Data Mining and Prediction
Causal Inference
Data Collection
Advanced Topics in Epidemiologic Methods
Analysis of Genetic Association Studies Using Unrelated Subjects
Screening
Bridging Psychiatric Morbidity and Reproductive Outcomes
Fundamentals of Epidemiology
Oral Health Policy Research Seminar
Epidemiologic Investigation of Social and Environmental Risks for Psychiatric Disorders
Inference in Infectious Disease Epidemiology
Nutritional Epidemiology of Cancer
Developmental Epidemiology of Adult Psychiatric Disorders
Obesity Epidemiology
Independent Study, Tutorials

Epidemiologic methods This area provides training in the development and application of new methods in epidemiologic research. Students learn to use and justify classical epidemiologic methods in study design, data analysis, and interpretation of results. Students also receive training in biostatistical areas most relevant to epidemiologic research. Recent innovations in epidemiologic methodology are introduced through advanced courses and tutorials. Doctoral students conduct research with faculty members in the development of new methodologies and in novel applications of existing methodologies. Those enrolling in this area of interest ordinarily have completed four semesters of college calculus and one semester of linear algebra. Students engaged in this area will have an opportunity for collaboration with researchers working in causal inference and allied sciences.

Epidemiology of aging This area is geared toward those interested in the diseases and conditions, as well as research methods, specific to older populations. Social and cultural aspects of health in older persons are also covered. Core courses focus on the epidemiologic aspects of the study of aging and include topics in biology, statistics, and other relevant fields. Numerous research opportunities on a wide range of issues, including neurologic diseases, osteoporosis, incontinence, and others, are available in the Department of Epidemiology, as well as the Department of Nutrition, Channing Laboratory, the Division of Preventive Medicine at Brigham and Women's Hospital, and Hebrew Rehabilitation Center for the Aged.

Infectious diseases Research in this area focuses on the biological and dynamic features of infectious diseases, with emphasis on the use of epidemiologic approaches to study the social, behavioral, and biological determinants of infectious disease emergence, transmission, pathogenesis, and immunity. Courses within the department cover the common features of communicable diseases and their dynamics, methods for the analysis of transmission dynamics, and advanced topics in the epidemiology of certain specific infectious diseases, especially HIV. Courses in other departments provide introductions to the epidemiology of additional specific infectious diseases and to additional relevant methodologies, including spatial and time-series analysis. Students in this area ordinarily join the interdisciplinary concentration in the epidemiology of infectious disease.

Molecular/genetic epidemiology This area introduces students to the application of molecular and genetic methods in epidemiology. These methods may be useful as measures of exposure, disease susceptibility, or disease outcome. Training encompasses family-based association methods, genome-wide association studies to identify the chromosomal localization of genes associated with disease, and fine mapping and identification of these genes. Population-based studies correlate variation in genes with disease risk and prognosis and assess gene-environment interactions. Relevant courses explore the genetic epidemiology of complex diseases, including cancer, cardiovascular disease, diabetes, psychiatric illnesses, Alzheimer's disease, and asthma, as well as individual variation in drug response (pharmacogenomics). Students can collaborate with the Department of Environmental Health, the Channing Laboratory, Dana-Farber Cancer Institute, and other research groups.

Neuroepidemiology This area provides training in research methodology and the epidemiology of neurological diseases. Current research is focused on the roles of diet, infections, and environmental exposures in the etiology of neurodegenerative diseases such as multiple sclerosis, Parkinson's disease, and amyotrophic lateral sclerosis and integrates biomarkers and genetic factors. Doctoral students conduct research in a substantive or methodological area related to neuroepidemiology.

Nutritional epidemiology Through courses in the Departments of Epidemiology and Nutrition, students in this area learn meth-

ods of nutritional assessment and their related strengths and weaknesses. Students also receive advanced training in the nutritional determinants of disease and in methods for analysis specific to research in nutritional epidemiology. Students can conduct research within several large prospective ongoing studies at HSPH and Harvard Medical School, including an examination of dietary factors in relation to cardiovascular disease, cancer, and other chronic diseases; a study of the interactions between nutritional and genetic determinants of disease; and the assessment of nutritional supplementation in relation to infectious agents and malnutrition.

Oral and dental health epidemiology This area prepares dentists and others interested in oral diseases for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. A new focus area is the links between oral conditions; nutrition; systemic diseases such as coronary heart disease, stroke, diabetes; and adverse pregnancy outcomes. Students can participate in field research activities; epidemiologic studies of oral health; or clinical trials designed to test preventive, diagnostic, or therapeutic interventions. This area of interest is jointly administered by the Department of Oral Health Policy and Epidemiology in the Harvard School of Dental Medicine and the HSPH Department of Epidemiology.

Pharmacoepidemiology This area focuses on the determinants of both unintended and expected effects of drugs, vaccines, and medical devices. Patterns of utilization of drugs, vaccines, and devices, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention represent important secondary themes. The Department of Epidemiology offers courses in pharmacoepidemiology and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and health services research. Students in pharmacoepidemiology have the opportunity to attend courses and congresses outside the school and are encouraged to undertake internships in regulatory agencies or pharmaceutical and biotechnology companies. Students ordinarily have a prior degree in medicine or pharmacy. Others are expected to acquire substantially equivalent expertise in areas related to their research.

Psychiatric epidemiology This area introduces students to concepts and methods for studying the genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses, as well as related courses offered in the Departments of Epidemiology, Biostatistics, and Society, Human Development, and Health. A wide range of research opportunities are available, with particular depth in psychiatric genetics, mental health services, pharmacoepidemiology, clinical trials, prevention, and community and cross-cultural studies.

Reproductive epidemiology This area focuses on the determinants and consequences of reproduction, including women's health and male infertility. Students can explore pubertal development, gynecologic disorders, sexually transmitted infections, the menstrual cycle, menopause, fertility, conception, assisted reproductive technologies, and pregnancy as endpoints or as factors influencing disease outcomes. The Obstetrics and Gynecology Epidemiology Center, based at Brigham and Women's Hospital, offers the opportunity to gain experience in data collection and analysis of large-scale population- and clinical-based epidemiologic studies. Students may collaborate with faculty members at HSPH and Harvard Medical School and also have the opportunity to pursue gynecological and reproductive health research at the many resources available in the area, including the Channing Laboratory, Harvard Pilgrim Health Care, and the Division of Preventive Medicine and Connors Center for Women's Health and Gender Biology at Brigham and Women's Hospital. Students are encouraged and given guidance on how to submit their own research proposals for private or federal funding.

Master of Science in Epidemiology (80-credit and 42.5-credit programs)
The master's programs provide students with basic skills in epidemiologic and quantitative methods and in computing, in preparation for research or academic careers. Graduates have taken positions as researchers in university and hospital settings and as epidemiologists for public health agencies and private companies.

The 80-credit SM program is designed for individuals who hold a bachelor's degree and have a strong background in biology and mathematics. The 42.5-credit program is open to applicants with a medical degree or master's-level background in biology.

Required courses for the 80-credit and 42.5-credit programs are the same and include schoolwide requirements, elements of epidemiologic research, the design and analysis of case-control and cohort studies, and the analysis of rates and proportions.

In addition to epidemiology and statistics courses, students in the 80-credit program study the basic medical sciences and the biological aspects of public health problems. The program is primarily intended for students who expect to continue toward a doctoral degree. Recommended courses cover human physiology and the pathophysiology of human disease, regression and analysis of variance in experimental research and applied regression for clinical research, introductory cancer biology, principles of toxicology, and the practice of quantitative methods.

In the 42.5-credit program remaining courses reflect areas of special interest and may include supervised research.

Doctor of Science in Epidemiology/ Doctor of Public Health

The doctoral programs are designed for students who plan careers in epidemiologic research or teaching or for those who aspire to leadership roles in the health professions. Recent graduates are working in major universities, medical schools, and research institutes. They also serve as epidemiologists for the National Cancer Institute, Centers for Disease Control and Prevention, other domestic and international governmental institutions, and private industry.

Applicants to the SD program should hold at least a bachelor's degree and have a strong background in biology and mathematics. For these individuals the degree generally takes four to five years to complete; candidates with relevant doctoral degrees may complete the program in three years. The DPH degree is available to students holding a prior doctorate and an MPH degree.

Normally most of the first two years is devoted to course work. Course requirements are the same as for the SM program, with the addition of courses on the practice of epidemiology, advanced epidemiologic methods, and principles of screening; and for nonphysicians, human physiology and the pathophysiology of human disease. Ten credits are also required in substantive courses offered by the department. Of the two minors required for the degree, one must be in advanced biostatistics.

Funding may be available for U.S. citizens or permanent residents enrolled in the doctoral program or a postdoctoral fellowship program; depending on the specialty area, funding sources include the National Cancer Institute and the National Institute of Mental Health. For U.S. citizens and permanent residents interested in cardiovascular disease or aging, research traineeships may be available through Harvard Medical School. The National Institute of Aging also offers research traineeships for doctoral students, postdoctoral fellows, and physicians engaged in postdoctoral training.

Related Offerings

Exposure, epidemiology, and risk and occupational health concentrations, Department of Environmental Health, see pages 11 and 13.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
Interdisciplinary concentration in women, gender, and health, see page 58.
Summer Program in Clinical Effectiveness, see page 59.

Contact Information

For more information about research and training in epidemiology, please contact the coordinator of academic services, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1055
Fax: 617-566-7805
Web: http://www.hsph.harvard.edu/Academics/epidem/index.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Hans-Olov Adami, MD, PhD; Visiting Professor of Epidemiology. Influence of lifestyle and genes on risk of cancer.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Nutritional epidemiology and epidemiology of neurological diseases.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

David C. Christiani, MD, MPH, SM; Professor of Occupational Medicine and Epidemiology. Occupational and environmental diseases; gene-environment interactions; biomarkers and molecular epidemiology.

E. Francis Cook, MA, SM, SD; Professor of Epidemiology. Epidemiologic methods; clinical epidemiology.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

Wafaie W. Fawzi, MBBS, MPH, SM, DPH; Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Stephen E. Gilman, SM, SD; Assistant Professor of Society, Human Development, and Health. Social epidemiology of psychiatric disorders; health disparities and the life course.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes, particularly for prostate and colorectal cancers; methodologies to measure dietary factors in epidemiologic studies.

Russ B. Hauser, MD, MPH, SD; Associate Professor of Environmental and Occupational Epidemiology. Reproductive and developmental epidemiology; impact of endocrine disruptors on fertility and pregnancy outcomes; contaminants.

Miguel A. Hernán, MD, MPH, MS, DPH; Associate Professor of Epidemiology. Epidemiologic methods; neuroepidemiology; HIV/AIDS.

Sonia Hernández Diaz, MD, MPH, DPH; Assistant Professor of Epidemiology. Drug safety evaluation; application of novel methods to pharmacoepidemiology.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type 2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MB, BS, MPH, SD; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology; molecular and genetic epidemiology.

Karestan C. Koenen, MA, PhD; Assistant Professor of Society, Human Development, and Health. Psychological trauma; posttraumatic stress disorder; developmental psychopathology; psychiatric genetics.

Peter Kraft, MA, MS, PhD; Assistant Professor of Epidemiology. Genetic epidemiology of complex diseases, especially cancer.

Francine Laden, MS, SD; Assistant Professor of Environmental Epidemiology. Environmental epidemiology of cancer and respiratory disease; refining methods for exposure assessment in large epidemiologic cohorts.

Frederick P. Li, MD, MA; Professor of Clinical Cancer Epidemiology. Inherited susceptibility to cancer; clinical and molecular epidemiology.

Marc Lipsitch, DPhil; Professor of Epidemiology. Theoretical, statistical, and experimental approaches to population biology and the epidemiology of infectious diseases.

Dominique S. Michaud, SD; Assistant Professor of Epidemiology. Modifiable and inherent risk factors of bladder, brain, and pancreatic cancers; inflammation in relation to cancer etiology.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology. Relationship between the workplace, the environment, and disease.

Nancy E. Mueller, SM, SD; Professor of Epidemiology. The role of viruses in the etiology of cancer; cancer epidemiology.

Megan B. Murray, MD, MPH, SD; Associate Professor of Epidemiology. Use and evolution of molecular markers in tuberculosis; transmission dynamics of infectious diseases; study of vaccine effects.

John H. Page, MBBS, MSc, SD; Assistant Professor of Epidemiology. Methods in clinical epidemiology; epidemiology of chronic diseases; causal inference; optimal health.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Development of analytic methods for drawing causal inferences from complex observational and randomized studies.

Joel D. Schwartz, PhD; Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

George R. Seage III, MPH, DSc; Associate Professor of Epidemiology. Biologic and behavioral determinants of HIV transmission and prevention; HIV clinical epidemiology and outcomes research; long-term impact of antiretroviral therapy on children.

Stephanie A. Smith-Warner, MS, PhD; Assistant Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk; evaluation of dietary assessment methods.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Binary data models with measurement error and misclassification in model covariates.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and lifestyle on health, particularly prostate cancer, other cancers, heart disease, and cognitive decline.

Dimitrios V. Trichopoulos, MD, SM; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology.

Eduardo Villamor, MD, MPH, DPH; Assistant Professor of International Nutrition. Interactions between nutrition, immunity, and infection; maternal and child nutrition; auxology.

Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Investigation of dietary factors, using epidemiologic methods, in the prevention of cardiovascular and other diseases.

Secondary Appointments

(primary appointments at Harvard Medical School, Harvard School of Dental Medicine, or Harvard Faculty of Arts and Sciences)

Deborah Blacker, MD, SD; Associate Professor in the Department of Epidemiology. Psychiatric epidemiology; assessment methods; genetic epidemiology; epidemiology of Alzheimer's disease and other neuropsychiatric disorders; genetic association analysis.

Julie E. Buring, MS, SD; Professor in the Department of Epidemiology. Epidemiology of chronic disease, primarily cardiovascular disease and cancer; epidemiologic methodology, especially clinical trials.

Carlos A. Camargo, Jr., MPH, MD, DPH; Associate Professor in the Department of Epidemiology. Asthma/COPD; anaphylaxis; emergency medicine; U.S. dietary guidelines.

Nancy R. Cook, SM, SD; Associate Professor in the Department of Epidemiology. Longitudinal data analysis; predictive modeling; hypertension prevention.

Daniel W. Cramer, MD, SM, SD; Professor in the Department of Epidemiology. Ovarian cancer; endometriosis; reproductive epidemiology.

Gary C. Curhan, MD, SM, SD; Associate Professor in the Department of Epidemiology. Nephrolithiasis risk factors and prevention; renal function decline risk factors; hypertension risk factors and prevention; gout; painful bladder syndrome; pneumonia; shingles.

Immaculata DeVivo, MPH, PhD; Associate Professor in the Department of Epidemiology. Etiology of cancer, specifically the relationship between genetic variation and disease risk for future prevention.

Alessandro Doria, MD, PhD, MPH; Assistant Professor in the Department of Epidemiology. Genetic epidemiology of type-2 diabetes, especially early-onset forms; genetic epidemiology of coronary artery disease in diabetes.

Chester W. Douglass, DMD, MPH, PhD; Professor in the Department of Epidemiology. Oral epidemiology and health policy.

Francine Grodstein, SD; Associate Professor in the Department of Epidemiology. Aging; health effects of exogenous hormones; risk factors for Alzheimer's disease.

Susan E. Hankinson, MS, MPH, SD; Associate Professor in the Department of Epidemiology. Relationships between hormonal factors and risk of breast and ovarian cancers.

Tobias Kurth, MD, SM, SD; Assistant Professor in the Department of Epidemiology. Risk factors for stroke, migraine, and chronic kidney disease; risks and benefits of analgesic use; propensity scores.

I-Min Lee, MBBS, MPH, SD; Associate Professor in the Department of Epidemiology. Epidemiology of cancer; physical activity and fitness and cancer incidence.

JoAnn E. Manson, MD, MPH, DPH; Professor in the Department of Epidemiology. Chronic disease epidemiology; cardiovascular and diabetes epidemiology; hormone replacement therapy; biomarkers.

Karin B. Michels, MS, MPH, SD, MSc, DPhil; Associate Professor in the Department of Epidemiology. Nutritional epidemiology and methodology; perinatal and reproductive risk factors for breast cancer.

Stacey A. Missmer, SM, SD; Assistant Professor in the Department of Epidemiology. Reproductive epidemiology: endometriosis, uterine leiomyoma, assisted reproductive technology, endogenous sex steroid hormones.

Murray A. Mittleman, MDCM, MPH, DPH; Associate Professor in the Department of Epidemiology. Epidemiology of acute risk factors triggering myocardial infarction and stroke; methodological problems in implementing case-crossover studies.

Dariush Mozaffarian, MD, DPH; Assistant Professor in the Department of Epidemiology. Cardiovascular epidemiology, particularly effects of dietary and lifestyle habits.

Lorelei A. Mucci, MPH, SD; Assistant Professor in the Department of Epidemiology. Biomarker studies of prostate cancer risk and survival.

Jane M. Murphy, PhD; Professor in the Department of Epidemiology. Longitudinal studies of psychiatric epidemiology in general populations.

Tianhua Niu, SD, MS; Assistant Professor in the Department of Epidemiology. Genetic dissection of complex traits; functional genomics; development of novel statistical methodologies; development of bioinformatics databases.

David L. Pauls, PhD; Professor in the Department of Epidemiology. Inheritance of behavior disorders in children and adults, specifically the interaction of genetic and environmental factors in the expression of these illnesses.

Janet W. Rich-Edwards, MPH, SD; Assistant Professor in the Department of Epidemiology. Prenatal and childhood predictors of cardiovascular disease and diabetes; lifestyle determinants of fertility and pregnancy outcome.

Paul M. Ridker, MD, MPH; Professor in the Department of Epidemiology. Molecular and genetic epidemiology of hemostasis, thrombosis, and inflammation; "predictive" medicine; etiology and prevention of acute coronary syndromes.

Eric B. Rimm, SD; Associate Professor in the Departments of Epidemiology and Nutrition. Relation of diet to diseases, especially obesity, diabetes, and cardiovascular disease; impact of antioxidants, B vitamins, fiber, and alcohol.

Susan L. Santangelo, SD; Associate Professor in the Department of Epidemiology. Genetic epidemiology of psychiatric disorders; statistical modeling of genetically complex (non-Mendelian) diseases.

Eva S. Schernhammer, MD, MPH, DPH, MS; Assistant Professor in the Department of Epidemiology. Chronic disease epidemiology; cancer biomarker and circadian rhythm research.

Sebastian Schneeweiss, MD, SM, SD; Associate Professor in the Department of Epidemiology. Pharmacoepidemiology and pharmaceutical outcomes research.

Daniel E. Singer, MD, MA; Professor in the Department of Epidemiology. Preventive health care.

Jordan W. Smoller, MD, SD; Associate Professor in the Department of Epidemiology. Psychiatric epidemiology; genetic association analysis; epidemiology and genetics of mood disorders; anxiety disorders, psychotic disorders and ADHD; pharmacogenetics.

Rulla Tamimi, MS, SD; Assistant Professor in the Department of Epidemiology. Molecular and cancer epidemiology; epidemiology of breast cancer with a focus on intermediate markers of risk.

Shelley S. Tworoger, MS, PhD; Assistant Professor in the Department of Epidemiology. Biomarkers in ovarian and breast cancer risk; ovarian cancer etiology.

Shumin Zhang, MD, MSc, SD; Assistant Professor in the Department of Epidemiology. Etiology of cancer; nutritional epidemiology; health effects of antioxidants, folates, alcohol, lipids, and obesity; biomarkers of nutrients.

Adjunct Faculty

Monique M.B. Breteler, MSc, MD, PhD. Erasmus University Medical Center, Rotterdam, the Netherlands.

Kin-Wei Arnold Chan, MD, MPH, SD. Ingenix Phramaceutical Services.

Graham A. Colditz, MBBS, MPH, DPH, MD. Washington University School of Medicine.

Richard C. Dicker, MD, SM. Centers for Disease Control and Prevention.

Bernard L. Harlow, MPH, PhD. University of Minnesota School of Public Health.

Albert Hofman. MD, PhD. Erasmus University Medical School, Rotterdam, the Netherlands.

Chung-Cheng Hsieh, MPH, SM, SD. University of Massachusetts Medical Center.

Kaumudi J. Joshipura, SM, SD. University of Puerto Rico.

Pagona Lagiou, MD, MS, PhD. University of Athens Medical School, Greece.

K. Malcolm Maclure, SM, SD. Ministry of Health, British Columbia, Canada.

Paola Muti, MD, MSc. Italian National Cancer Institute, Rome.

John D. Seeger, PharmD, MPH, DPH. Ingenix Pharmaceutical Services.

Ming T. Tsuang, MD, PhD, DSc. University of California, San Diego.

Alexander M. Walker, MPH, MD, DPH. Ingenix Pharmaceutical Services.

CHRISTIAN DIBBLE

Doctoral student, Department of Genetics and Complex Diseases

Christian Dibble has always been interested in science, but over the years his focus has shifted from environmental sciences to molecular biology. After graduating from Cornell, where he majored in plant molecular biology, Christian was drawn to Boston and its mix of universities and biotech companies. Christian first landed a job as a research assistant in a neurobiology lab at the Eunice Kennedy Shriver Center. Next he spent over five years in the oncology group at Curis, Inc., researching drugs that could be used to block the Hedgehog signaling pathway, involved in the progression of some cancers. (One of these drugs is now being tested clinically.) By then Christian was sure he wanted to make cancer the focus of his career. "Unfortunately, during our lifetime we all know someone who develops cancer," he observes. "And cancer is a fascinating context in which to study cell biology." As a doctoral student Christian is working with Assistant Professor Brendan Manning in the Department of Genetics and Complex Diseases on another signaling pathway, TSC1/2-mTOR, key to the development of certain metabolic diseases and cancers. "I feel very motivated and excited by the research I am doing," he says. His other main enthusiasm is music—Christian collects classic soul and does a weekly broadcast on an internet radio station.

DEPARTMENT OF GENETICS AND COMPLEX DISEASES

The complex interplay of biological processes with environmental factors as they apply to chronic, multigenic, and multifactorial diseases is the emphasis of the Department of Genetics and Complex Diseases. Research programs in the department focus on molecular mechanisms of adaptive responses to environmental signals to elucidate the mechanisms underlying the intricate interaction between genetic determinants and their divergent responses to stress signals or metabolic input. Alterations in these integrated adaptive mechanisms, central to many devastating disorders, have a major impact on the health of human populations.

The research activities in the Department of Genetics and Complex Diseases and its pre- and postdoctoral training programs concentrate on the molecular, cellular, and organismic adaptations and responses to nutrients, toxins, and radiation stress and explore the genetic and molecular networks controlling these interactions in experimental systems. The integrated interdisciplinary opportunities also aim to apply this knowledge to human populations to understand, prevent, and treat complex human diseases.

Faculty research is concentrated within several broad categories, including stress and inflammatory signaling pathways, nutrient sensing and molecular transport, oxidative stress, horomone action, and metabolic homeostasis, and the role of endoplasmic reticulum dysfunction, nuclear hormone receptors, cell growth and proliferation, and protein stability. The diseases under study include nutritional and metabolic diseases such as obesity, diabetes, and cardiovascular diseases; cancer; and aging. As most of these health problems emerge as clusters, the translation of research involves multidisciplinary collaborations with faculty members in other HSPH departments and Harvard-affiliated centers, as well as other institutions.

Degree Programs in Genetics and Complex Diseases

As described below, the department offers the doctor of philosophy (PhD) program. No master of science programs are available.

Doctor of Philosophy in Biological Sciences in Public Health (Genetics and Complex Diseases)

Students wishing to study disease mechanisms and the integrated biology of chronic complex diseases (including metabolic disorders, cancer, and aging) as they pertain to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. For more information about the PhD program, see page 57.

Contact Information

For more information about research and training in genetics and complex diseases, please contact Julie Gound, director of administration, Department of Genetics and Complex Diseases, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0054
Fax: 617-432-5236
Email: jgound@hsph.harvard.edu

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

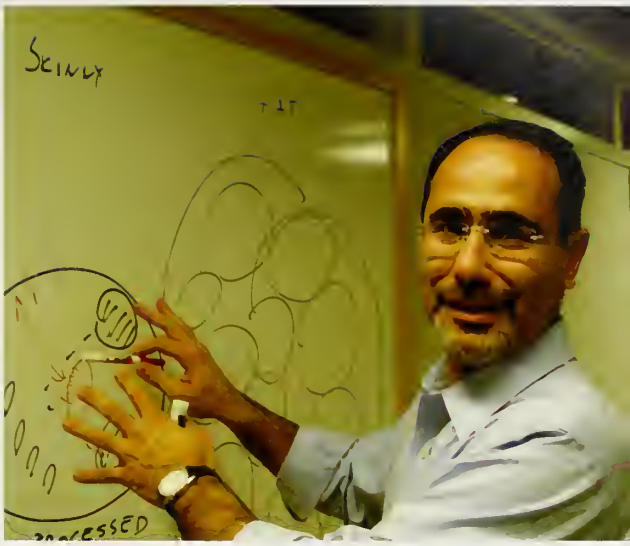
The GSAS application in hard copy is available at the same web address.

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Bruce F. Demple, PhD; Professor of Toxicology. Repair enzymes for oxidative DNA damage; molecular biology of cellular responses to oxidative stress.



Chih-Hao Lee, PhD; Assistant Professor of Genetics and Complex Diseases. Understanding the interaction between dietary fats and nuclear hormone receptors, and defining the regulatory mechanisms by these receptors that are relevant to the pathogenesis of metabolic diseases.

Brendan D. Manning, PhD; Assistant Professor of Genetics and Complex Diseases. Signal transduction pathways underlying tumor development and metabolic diseases.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

Zhi-Min Yuan, MD, MS, PhD; Associate Professor of Radiobiology. Cancer biology; radiation research; cell-cycle regulation; signaling pathways.

Adjunct Faculty

Albert J. Fornace, Jr., MD. Georgetown University.

Guy L. Reed III, MS, MD. Medical College of Georgia.

Mark T. Seielstad, PhD. Genome Institute of Singapore.

Dieter A. Wolf, MD. Burnham Institute for Medical Research.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Introduction to Cancer Biology

Cell Response to Mutagens and Carcinogens

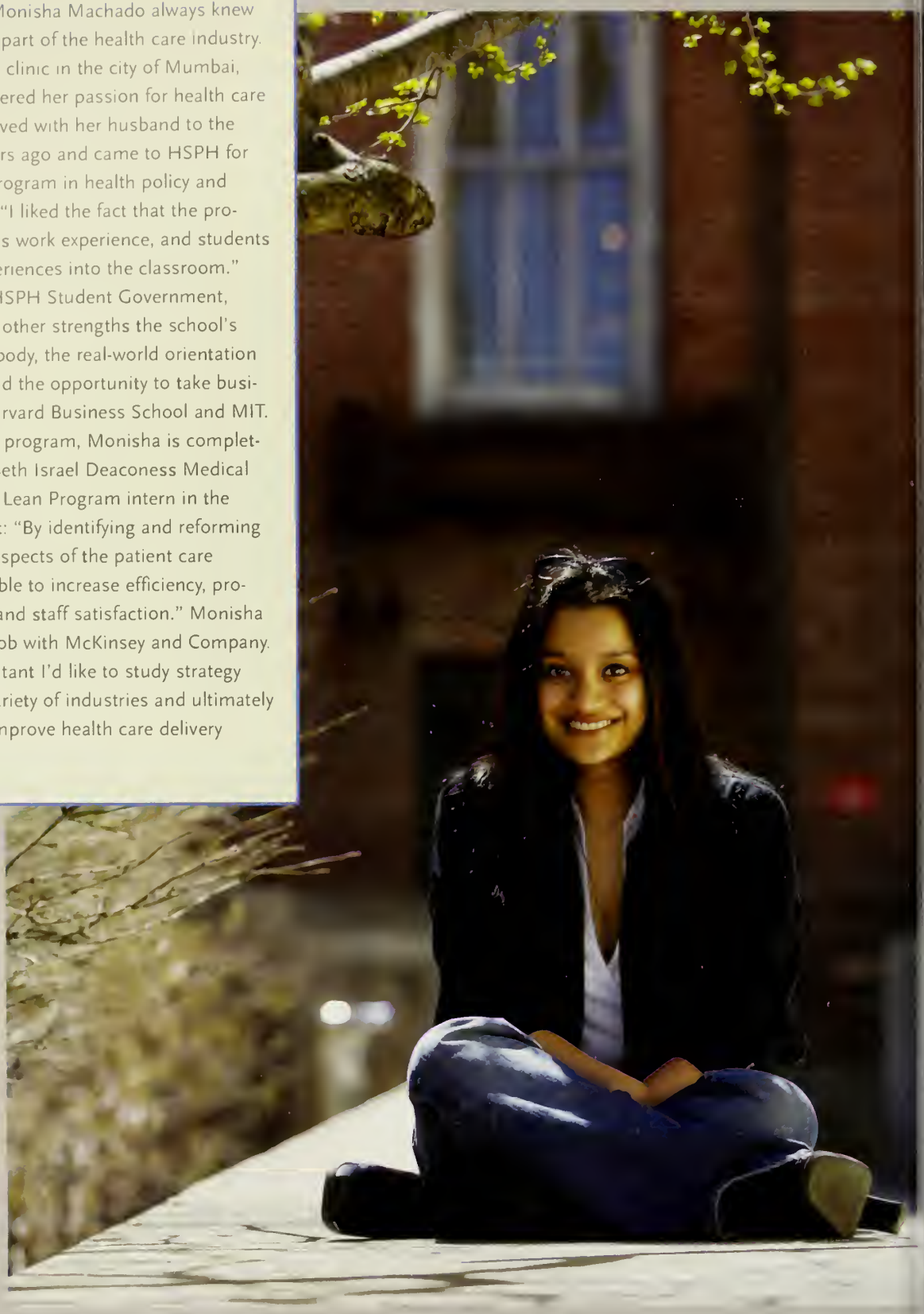
Functional Genomics, Proteomics, and Bioinformatics

Independent Study, Tutorials

MONISHA MACHADO

Master's student, Department of Health Policy and Management

Trained as a dentist, Monisha Machado always knew that she wanted to be part of the health care industry. While helping to run a clinic in the city of Mumbai, India, Monisha discovered her passion for health care management. She moved with her husband to the United States four years ago and came to HSPH for the master's degree program in health policy and management (HPM): "I liked the fact that the program required previous work experience, and students could bring these experiences into the classroom." The president of the HSPH Student Government, Monisha mentions as other strengths the school's international student body, the real-world orientation of the HPM faculty, and the opportunity to take business classes at the Harvard Business School and MIT. In the final year of her program, Monisha is completing her practicum at Beth Israel Deaconess Medical Center, where she is a Lean Program intern in the Office of the President: "By identifying and reforming the non-value-added aspects of the patient care process, we've been able to increase efficiency, productivity, and patient and staff satisfaction." Monisha has already landed a job with McKinsey and Company. She says, "As a consultant I'd like to study strategy and operations in a variety of industries and ultimately apply those skills to improve health care delivery globally."



DEPARTMENT OF HEALTH POLICY AND MANAGEMENT

The Department of Health Policy and Management is a mission-oriented department concerned with improving the health care delivery system and mitigating public health risks in the United States and abroad. The department is dedicated to resolving major management and health policy problems through original research, advanced training, and dispute resolution. Research priorities in the Department of Health Policy and Management are organized into nine broad areas:

- health financing and insurance, including the creation of new physician payment systems and the design of public policies dealing with rising insurance premiums
- management of health hazards, including use of risk assessment to set priorities for environmental health protection
- study of the causes and etiology of injury and the application of that work to the development and evaluation of prevention and intervention strategies and policy
- management of health care organizations, encompassing the application of corporate strategic-planning concepts to the challenges faced by health systems and pharmaceutical firms
- evaluation and management of medical technology, including the meta-analysis of data from clinical trials
- business and labor in health, including the negotiation of occupational safety and health care benefits in the collective-bargaining process
- international health, including evaluation of the cost-effectiveness of health programs in developing countries
- quality of health care, encompassing the design of better methods to measure quality
- health care reform, involving the development of partnerships between the department and the corporate community to explore critical aspects of health policy and management

The department's problem-solving orientation is exemplified by its strong ties to leading health practitioners in hospitals, managed-care plans, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

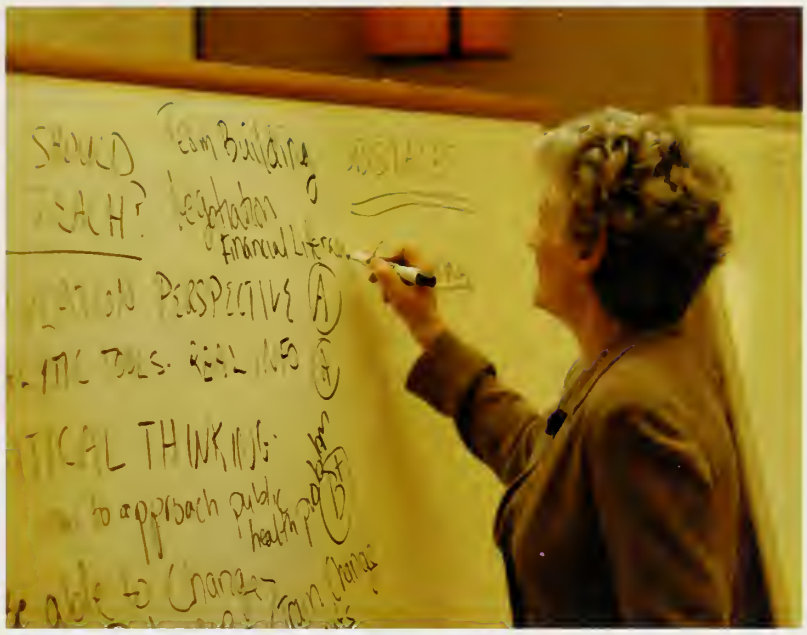
Degree Programs in Health Policy and Management

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, a nonresidential, part-time SM in health care management for physician and dental executives, and a doctor of science (SD) program. The department also participates in the universitywide doctor of philosophy (PhD) Program in Health Policy. For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Science in Health Policy and Management (80-credit and 42.5-credit programs)

The 80-credit SM program emphasizes professional skills and concepts; a solid grounding in the substance of health problems; rigorous quantitative training; and a curriculum that combines professional, academic, and practice activities. Acquired knowledge is applied to practical situations through a required summer internship program and a field research project. This professional program is designed for students who are building careers in health-related fields and who aspire to leadership roles in the public or private sector. Recent graduates have taken positions in local, state, and federal government agencies; consulting companies; public policy research organizations; community health centers; hospitals; health plans; and pharmaceutical companies. Others have gone on to doctoral and fellowship programs.

Applicants to the 80-credit program come from a wide variety of undergraduate fields. They are expected to have full-time work experience and an academic record, particularly in quantitative and analytical courses, that suggest outstanding potential in the areas of health policy and management. Applicants should have at least two years of relevant postbaccalaureate work experience in the health field; exceptions are occasionally made for outstanding candidates. Deferred admission is available for applicants who demonstrate strong potential but who lack sufficient professional experience in the health sector. These applicants work within the health field in positions approved by the program for a minimum of one year before matriculating.



Of the 80 credits necessary to earn the SM, required courses account for 30 to 35. In addition to fulfilling schoolwide requirements, students must satisfy the requirements of at least one of three areas of interest:

Management This area of interest is for students pursuing management careers in public- or private-sector health institutions

Policy This area of interest is intended for those who wish to become involved in the formulation of health policy, including medical care policy, heath finance and insurance, access to health care, payment to institutions and practitioners, political analysis and strategy, and Medicare and Medicaid reform.

Research This area of interest is geared toward students looking toward doctoral education and research careers in fields such as health economics, quality of care, technology assessment, health decision analysis, and advanced statistical analysis.

The requirements for the management, policy, and research areas of interest are described in a guide available from the department. After the required credits have been completed, students are encouraged to enroll in relevant courses at Harvard Business School, Kennedy School of Government, and Harvard Graduate School of Education.

The 42.5-credit SM program is designed for students pursuing research careers in public- or private-sector health care institutions, particularly physicians and other candidates with relevant advanced degrees who desire intensive training in analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions. Recent graduates have taken research positions at academic medical centers and other health care organizations.

Applicants to the 42.5-credit program should hold graduate medical or other professional degrees and have significant experience in health services. They typically expect to devote a substantial portion of their careers to research in areas such as health services research, cost-effectiveness analysis, and clinical decision making.

Students fulfill schoolwide requirements and take up to 10 tutorial credits and an additional 10 credits in courses within the department. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health services research, health decision sciences, quality improvement, technology assessment, and program evaluation.

Master of Science in Health Care Management

The SM in health care management is a 42.5-credit, two-year, part-time, nonresidential degree program that trains clinicians in the executive skills required for management. This professional program is targeted to midcareer MDs, DMDs, and DDSs with significant management responsibilities who wish to be more effective in their roles in the health care sector.

The program includes course work on strategy determination, financial analysis, negotiation, organizational behavior, operations management, information systems, and quality-of-care management. Degree candidates are required to spend three weeks each summer on campus, as well as five four-day weekends (Friday through Monday) each academic year. Scheduled teleconferences, an estimated ten to fifteen hours per week of assignments, and a final practicum are also required.

This is a closed-cohort learning situation. Attendance at all sessions is mandatory, and previous courses and/or degrees will not be applied to degree requirements. No auditing or cross-registration is allowed.

Doctor of Science in Health Policy and Management

The SD program in health policy and management is designed for physicians, lawyers, and other professionals who are interested in doctoral-level research training in health policy and who are committed to applied,

interdisciplinary research. The program prepares graduates to perform research in the academic or professional realm.

Applicants must hold an MD, a DDS, a PhD, or a JD degree. Except in rare cases the department also expects that applicants will be in progress toward or will have already obtained a degree at HSPH. Moreover, applicants should have a strong aptitude in a quantitative discipline (demonstrated by prior academic performance, work experience, and standardized test scores), experience in the health sector, and the ability to perform original and independent work. Applicants should indicate their anticipated area of interest within the department and anticipated faculty mentor in their application. An environmental science and risk management area of interest is offered jointly with the Department of Environmental Health.

In addition to schoolwide requirements, candidates complete a set of required courses in decision science, economics, program evaluation, health politics, and public health law (lawyers only). Each student works closely with a faculty adviser to develop an individual plan of study. While students in this program have the opportunity to take courses throughout the university, all required courses are offered through HSPH.

Doctor of Philosophy in Health Policy

The doctor of philosophy in health policy is a collaborative program of six Harvard University faculties: the Graduate School of Arts and Sciences, School of Public Health, Medical School, Kennedy School of Government, Law School, and Business School. Because this is an interfaculty program, enrolled students take courses throughout the university. The PhD is awarded by the Faculty of Arts and Sciences. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Health Policy. The deadline for applying to the PhD program is December 15, 2007.

The program prepares students for tenure-track positions and other research positions at schools of public health, public policy, and medicine; organizations such as the Kaiser Family Foundation, the RAND Corporation, the World Health Organization, and Memorial Sloan-Kettering Cancer Center; and government agencies such as the Congressional Budget Office and the Centers for Disease Control and Prevention.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Ecanamic Analysis
Ecanamic Analysis far Public Health
Health Care Regulatian and Planning
Capstane Caurse in Law and Public Health
Pragram Evaluatian in Health Policy
Public Health Law
Advanced Tapics in Health Law and Policy
Camplementary and Alternative Medicine: Health Law and Policy
Financial Transactians and Analysis
Financial Management and Cantral
Financial Management af Health Care Organizatians
Public Speaking far Managers
Ecanamics af Health Policy
Intraductian ta the New American Health Care System: Law, Policy, and Management
Managing Peaple in Health Care Organizatians
Campetitive Strategy
Operatians Management in Service Delivery Organizatians
Strategic Marketing Management in Health Systems
Managed Care Policy Issues
Health Ecanamics: Ecanamic Analysis af the Health Care System
Public Health Leadership Skills
Seminar in Health Policy
Palitical Analysis and Strategy far U.S. Health Policy
Impraving Quality in Health Care
Payment Systems in Health Care
Health Policy Issues: Access ta Dental Services
Survey af Methads in Health Services Research
Current Issues in Health Policy
Skills and Methads af Health Care Negatiatian and Canflict Resalutian—Intraductary and Advanced
Applied Research and Practice in Health Policy and Management
Applied Research in the Law af Health Policy and Management
Research Ethics
Dactaral Seminar in Health Ecanamics
Public Opinian, Palling, and Public Policy
Research with Large Databases
Intraductian ta Management af Health Care Organizatians
Medical Infarmatics
Quality Impravement in Health Care
American Vialence: The Intersectian Between Hame and Street
Organizing Cansumer and Cammunity Interests in the Health System
Racial and Ethnic Disparities in Health: Histarical and Cantemparary Issues
Principles af Suicide Preventian
Measuring and Analyzing the Outcames af Health Care
Infarmatian Technalagy and Chranic Disease Management
Quality af Health Care: Current Challenges and Strategies far Change
Strategic Leadership: Knaw Thyself
Leading Change
Law and Public Health
Principles af Injury Cantral
Palitics and Strategies far Change in Health Policy
Ethical Basis af the Practice af Public Health
Ethical Basis af the Practice af Public Health: Health Care Delivery
Practice af Health Care Management
Enviranmental Health Risk: Cancepts and Cases
Theary and Practice af Public Health in the United States
Pharmacaecanamics
Decisian Analysis far Health and Medical Practices
Cast-Effectiveness and Cast-Benefit Analysis far Health Pragrams Evaluatians
Evaluatian af Benefit-Cast Analysis in Public Health and Enviranmental Palicy
Decisian Theary
Decisian Analysis Methads in Public Health and Medicine
Decisian Analysis in Clinical Research
Research Seminar an Risk and Decisian Analysis
Methads far Decisian Making in Medicine
Independent Study, Tutarials

Applicants wishing to combine the PhD Program in Health Policy with either the MD program at Harvard Medical School or the JD program at Harvard Law School must apply separately to each program and indicate in the PhD application that they are also applying to the MD or JD program.

Applicants must submit GRE or GMAT exam scores that are less than five years old, and individuals whose native language is not English must submit TOEFL scores. A graduate degree is not required for admission; however, with the possible exception of applicants wishing to pursue a combined degree (see above), preference is given to

those with either relevant work experience or some prior graduate work.

Degree requirements include approximately two years of course work; a concentration in one academic discipline (decision science, economics, ethics, evaluative science and statistics, management, medical sociology, or political analysis); at the dissertation stage specialization in one of five policy areas (environmental health, health care services, international health, mental health, or public health); general and concentration exams (usually at the end of the second year); a dissertation prospectus and oral examination; a dissertation based on original research; and a dissertation defense.

Financial aid is available to applicants admitted to the program, especially from the Agency for Healthcare Research and Quality and the National Institute of Mental Health. Full tuition and stipend are available to admitted minority students with demonstrated need.

Postdoctoral Fellowships

The department offers two-year postdoctoral fellowships to candidates who wish to do independent research in such areas as quality of medical care, technology assessment and cost-effectiveness, health care policy, management of health care organizations, and AIDS policy. The program emphasizes methodology in evaluation research, decision science, economics, and organizational analysis and permits fellows to design individualized programs of study. Fellows may also apply for admission to a formal degree program. Candidates must hold an MD, a DDS, a PhD, or an equivalent degree and must be U.S. citizens or permanent residents. Applicants must submit a curriculum vitae; three letters of reference; most recent transcript and standardized test scores; and a statement describing career goals, research interests, and reasons for applying. The application deadline is December 1, 2007, for a fellowship beginning in July 2008.

Related Offerings

Environmental science and risk management area of interest, Department of Environmental Health, see page 13.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
MPH concentrations in health care management and policy and in law and public health, see pages 54 and 55.

Contact Information

For more information about SM and SD programs in health policy and management, please contact Anne Occhipinti, director of academic programs, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-4511
Fax: 617-432-3699
Email: aocchipi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/hpm

For more information about the SM degree in health care management, please contact Colin Fleming, program coordinator, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-7075
Email: cfleming@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mhcm

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

For specific information about the PhD program, please contact Debbie Whitney, assistant director, PhD Program in Health Policy, 79 John F. Kennedy Street, Cambridge, MA 02138, or visit the program website.
Phone: 617-496-5506
Fax: 617-496-2860
Email: deborah_whitney@harvard.edu
Web: http://www.fas.harvard.edu/~healthpl

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Arnold M. Epstein, AM, MD; John H. Foster Professor of Health Policy and Management Access and quality of care, especially in disadvantaged populations.

Katherine Baicker, PhD; Professor of Health Economics. The financing of health insurance; health care disparities; spending on public programs and fiscal federalism.

Robert J. Blendon, MBA, MPH, DS; Professor of Health Policy and Management. Politics of health care; access to health care; approaches to health care reform; influence of public opinion in shaping health policy.

Paul H. Campbell, MPA, SD; Lecturer on Management. Financial management, strategic planning, and public health infrastructure; health system issues in developing countries.

Susanne J. Goldie, MD, MPH; Professor of Health Decision Science. Development of disease-specific transition models; quality-of-life assessment; cost-effectiveness analysis of preventive interventions.

James K. Hammitt, SM, MPP, PhD; Professor of Economics and Decision Sciences. Mathematical modeling and analysis of economic behavior and decision making under uncertainty.

David Hemenway, MA, PhD; Professor of Health Policy. Intentional and unintentional injury; health care economics.

William C. Hsiao, MPA, PhD; K.T. Li Professor of Economics. Health care systems; control of health care costs; universal insurance coverage.

Ashish K. Jha, MD, MPH; Assistant Professor of Health Policy and Management. Quality improvement; reduction of racial/ethnic disparities in health care; impact of information technology adoption on quality and disparities in health care.

Nancy M. Kane, MBA, DBA; Professor of Management and Associate Dean for Educational Programs. Organizational strategies in the health care system; provider behavior under third-party payment systems; governance of nonprofit organizations.

Jack Kasten, MPH, JD; Lecturer on Health Services. Managed care; service utilization; manpower issues; hospital organization and management.

Jane J. Kim, SM, PhD; Assistant Professor of Health Decision Science. Mathematical modeling and cost-effectiveness analysis to inform resource allocation decisions; calibration of disease simulation models; women's health and mental health.

Howard K. Koh, MD, MPH; Harvey V. Fineberg Professor of the Practice of Public Health and Associate Dean for Public Health Practice. Cancer prevention and control; skin oncology; tobacco control; health disparities.

Jonathan I. Levy, SD; Mark and Catherine Winkler Associate Professor of Environmental Health and Risk Assessment. Health impacts of power plants and transportation; air pollution exposure assessment and risk assessment; environmental equity; indoor air quality.

Leonard J. Marcus, MSW, PhD; Lecturer on Public Health Practice. Negotiation, conflict resolution, and use of mediation in health care settings; leadership and meta-leadership for addressing major public health challenges.

Michelle M. Mello, MPhil, PhD, JD; C. Boyden Gray Associate Professor of Health Policy and Law. Empirical analysis of health law issues; medical malpractice; patient safety; ethics; managed care; pharmaceuticals; public health law.

Matthew J. Miller, MD, MPH, SD; Assistant Professor of Health Policy and Management. Injury and violence prevention; medical ethics; public health ethics; pharmacoepidemiology; health economics.

Joseph P. Newhouse, PhD; John D. MacArthur Professor of Health Policy and Management. Financing and organization of medical care; medical malpractice; manpower policy; outcomes research.

R. Heather Palmer, MBBCh, SM; Professor of Health Policy and Management. Quality of health care; incorporation of evaluation measures into health care reform plans.

Deborah B. Prothrow-Stith, MD; Professor of Public Health Practice and Associate Dean for Faculty Development. Community-based violence prevention; violence prevention protocols for primary care settings; racial and ethnic health disparities; adolescent medicine.

Howard L. Rivenson, MBA, PhD; Lecturer on Health Management. Financial management of health care organizations; not-for-profit organization governance issues; community health centers.

Marc J. Roberts, PhD; Professor of Political Economy. Health policy; environmental policy; ethical aspects of public health policy; health sector reform.

Meredith Rosenthal, PhD; Associate Professor of Health Economics and Policy. Provider payment incentives and quality and cost of health care; impact of benefit design and other consumer incentives on quality and cost of care; pharmaceutical promotion and pricing.

Katherine Swartz, MS, PhD; Professor of Health Policy and Economics. Populations without health insurance; financing of universal health insurance; structures of financial incentives for physicians.

Kimberly M. Thompson, MS, SD; Associate Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as lifesaving devices; applications of value-of-information techniques to environmental health decisions.

Nancy Turnbull, MBA; Senior Lecturer on Health Policy and Management and Associate Dean for Educational Programs. Health insurance regulation; health care access; international applications of managed care.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Secondary Appointments

(primary appointments at Harvard Medical School)

John Z. Ayanian, MD, MPP; Associate Professor in the Department of Health Policy and Management. Impact of gender, race, insurance coverage, and socioeconomics on access to care and clinical outcomes.

David W. Bates, MD, SM; Professor in the Department of Health Policy and Management. Clinical decision making and physician behavior; quality of care and cost-effectiveness; outcome assessment.

Donald M. Berwick, MPP, MD; Professor in the Department of Health Policy and Management. Health care quality assessment, management, and improvement; technology assessment and cost-effectiveness analysis; decision analysis and clinical epidemiology.

Troyen A. Brennan, MA, JD, MPH, MD; Professor in the Department of Health Policy and Management. Medical ethics; personal injury and environmental litigation; medical malpractice and health policy reform.

David J. Cohen, MD, SM; Associate Professor in the Department of Health Policy and Management. Application of health outcomes research and cost-effectiveness analysis to interventional cardiology.

Michael H. Cohen, JD, MBA, MFA; Assistant Professor in the Department of Health Policy and Management. Health law and regulation; complementary, alternative, and integrative medicine law and policy; medical ethics.

Craig C. Earle, MD, MSc; Associate Professor in the Department of Health Policy and Management. Quality-of-care assessment; cancer survivorship; economic evaluation.

Kenneth A. Freedberg, MD, SM; Associate Professor in the Department of Health Policy and Management. Decision analysis; cost-effectiveness analysis; clinical epidemiology and outcomes research; HIV disease.

Atul A. Gawande, MA, MD, MPH; Assistant Professor in the Department of Health Policy and Management. Reduction of errors and complications in surgery; global provision of surgical care; narratives from medicine.

G. Scott Gazelle, MD, MPH, PhD; Professor in the Department of Health Policy and Management. Technology assessment; health services research.

Robert A. Greenes, MD, PhD; Professor in the Department of Health Policy and Management. Biomedical informatics; knowledge management and decision support strategies for enhancing quality and safety of health care.

Edward Guadagnoli, MA, PhD; Professor in the Department of Health Policy and Management. Evaluation of the outcomes of health care, access to care, and health care interventions.

Jeffrey N. Katz, MD, SM; Associate Professor in the Departments of Environmental Health and Health Policy and Management. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

Thomas H. Lee, Jr., MD, SM; Professor in the Department of Health Policy and Management. Prognostic stratification in and cost-effectiveness analysis of cardiovascular disease management.

Jeffrey Levin-Scherz, MD, MBA; Assistant Professor in the Department of Health Policy and Management. Health care affordability; managed care; provider incentives and disease management.

Matthew H. Liang, MD, MPH; Professor in the Department of Health Policy and Management. Epidemiology of rheumatic disease and disability; clinimetrics; health services research; technology assessment.

Tracy A. Lieu, MD, MPH; Professor in the Department of Health Policy and Management. Children's primary care delivery and outcomes; cost-effectiveness analysis.

Lisa A. Prosser, MS, MS, PhD; Assistant Professor in the Department of Health Policy and Management. Cost-effectiveness and decision analysis; preference measurement for children's health; vaccination and prevention programs.

Eric C. Schneider, MSc, MD; Associate Professor in the Department of Health Policy and Management. Health care quality, including quality measurement, organizational and socioeconomic influences, and quality-improvement strategies.

Jane C. Weeks, MD, SM; Professor in the Department of Health Policy and Management. Outcomes of cancer treatment; effectiveness of resource utilization in medical oncology; medical decision making in oncology.

Joel S. Weissman, PhD; Associate Professor in the Department of Health Policy and Management. Access to care for the uninsured; disparities in care for vulnerable populations; quality and patient safety; drug policy.

Adjunct Faculty

Mark A. Bloomberg, MD, MBA. Tufts University School of Medicine.

Mark J. Campbell, MEd. M. J. Campbell Associates.

James B. Conway, MA, MS. Institute for Health Care Improvement.

Maria G.M. (Myriam) Hunink, MD, PhD. Erasmus University Medical Center, Rotterdam, the Netherlands.

David Javitch, MA, PhD. Boston University.

Cleve L. Killingsworth, MPH. Blue Cross Blue Shield of Massachusetts.

Karen M. Kuntz, SM, SD. University of Minnesota School of Public Health.

Zita Lazzarini, JD, MPH. University of Connecticut School of Medicine.

Lucian L. Leape, MD. Institute for Healthcare Improvement.

Eugene Litvak, MS, PhD. Boston University School of Public Health.

George D. Lundberg II, MD, MS, ScD. Medscape.

Linda MacCracken, MBA. Solucient Business Development.

John E. McDonough, MPA, DPH. Health Care for All.

George B. Moseley III, MBA, JD. University Seminar Center.

Jeremy J. Nobel, MD, MPH, SM. GTE Laboratories.

Alice A. Noble, JD, MPH. Attorney at law in private practice.

Joseph S. Pliskin, SM, PhD. Ben-Gurion University, Israel.

Dorothy E. Puhy, MBA. Dana-Farber Cancer Institute.

Karen M. Quigley, MPH. Health care consultant.

Vinod K. Sahney, MSME, PhD. Henry Ford Health System.

Richard B. Siegrist, Jr., MS, MBA. WebMD Quality Services.

David M. Studdert, LLB, MPH, SD. University of Melbourne, Australia.

AMY BEI

Doctoral student, Department of Immunology and Infectious Diseases

"As a little girl, I used to collect microorganisms in the creek behind my house," Amy Bei recounts. A native of Santa Rosa, California, and the first scientist in her family, Amy began her serious foray into the study of diseases during three summers at the University of California, San Francisco. Her experience there in a "very international" lab working on schistosomaisis and other parasites confirmed her interest in "research on diseases of the developing world, diseases that are often neglected." As an undergraduate at Harvard, Amy was involved in malaria research at HSPH. Then she won a one-year Fulbright fellowship to work on malaria in Tanzania. Now back at HSPH as a doctoral student, Amy reports that she had three great lab rotations before joining her dissertation lab. (Students in her program can apply to work in any laboratory at Harvard.) She spent the fall of 2007 doing malaria research in Senegal and has learned basic Wolof, the Senegalese language—one of eight she has studied. Amy likes the school's approach to international collaborations: "I admire the way HSPH feels a responsibility to train and build capacity within developing countries." When she completes her PhD, Amy intends to go to medical school. She wants to provide immediate care to developing-world populations as well as work toward longer-term research-based solutions.

DEPARTMENT OF IMMUNOLOGY AND INFECTIOUS DISEASES

The Department of Immunology and Infectious Diseases focuses on the biological, immunological, epidemiological, and ecological aspects of viral, bacterial, protozoan, and helminthic diseases of animals and humans and the vectors that transmit some of these infectious agents.

Research in the department emphasizes basic pathogenic mechanisms that may lead to better diagnostic tools, the development of vaccines and other interventions for prevention and control of infection and disease, and the identification of new targets for antiviral and antiparasitic drugs. Laboratory-based research within the school may be supplemented by field-based studies of epidemiological and ecological aspects of infectious disease transmission and control. Diseases of developing countries are emphasized.

Members of the department take a multidisciplinary approach that includes immunology, molecular biology, public health entomology, cell biology and ultrastructure, biochemistry, pathology, virology, epidemiology, and ecology. The faculty undertakes research both within the school and around the world.

Infectious diseases currently under study include protozoa (malaria and leishmania), helminths such as schistosomes, viruses (HIVs, leukemia retroviruses, West Nile and eastern equine encephalitis), and bacteria (Lyme disease agents, ehrlichia, tuberculosis). Further immunologic studies focus on genetic regulation of the immune response, the function and regulation of T-cell-derived cytokines, and cytokines involved in the regulation of inflammation.

Degree Programs in Immunology and Infectious Diseases

As described below, the department offers doctor of science (SD) and doctor of philosophy (PhD) degree programs. No master of science programs are available.

Students in both programs choose among the areas of interest described below:

Immunology The curriculum for this area of interest currently focuses on genetic regulation of the immune response and the function and regulation of T-cell-derived cytokines. Students take courses in cell biology, immunology, and molecular immunology.

Immunology and molecular biology of parasitic and other infections This area of interest introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. The program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

Infectious disease epidemiology and tropical public health This area of interest provides a solid understanding of epidemiology, ecology, and control of infectious diseases in developing countries. It emphasizes control and prevention measures and the biological basis of diseases caused by pathogens that range from viruses to parasites.

Vector biology, ecology, and control This area of interest focuses on the manner in which blood-feeding arthropods interact with their various vertebrate hosts and with the human pathogens that they transmit. This area combines biological experimentation, epidemiological analysis, and population studies. Students become familiar with the various arthropods that are associated with human disease and learn the ways environmental change may result in ill health. Students conduct studies on mechanisms of transmission of vector-borne pathogens, both in the laboratory and in the field, and devise novel intervention strategies.

Virology This area of interest is designed to prepare a future generation of experts for new developments in the pathogenesis and prevention of AIDS and other infectious diseases. At present the program emphasizes the epidemiology, biology, and vaccinology of AIDS as an example of a complex infectious disease. Students take courses in virology, vaccine development, and related fields.

Doctor of Science in Immunology and Infectious Diseases

The SD program is designed for those interested in immunology, molecular biology, virology, and the epidemiology of infectious diseases. The program prepares students for postdoctoral research fellowships; junior faculty positions at academic institutions; and positions in independent research institutions, governmental agencies, and the biotechnology industry.

Applicants to the SD program should have a clinical degree (MD, DVM, DMD, or equivalent). This program is also available to candidates without a clinical degree who wish to apply to the interdisciplinary concentration in the epidemiology of infectious disease. To enter the program through the Department of Immunology and Infectious Diseases, candidates must have adequate background in modern biology, including microbiology.

This program aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course work during the first one or two years emphasizes cellular and molecular biology, virology, immunology, and genetics. Course work for students focusing on the epidemiology of infections also emphasizes epidemiology, biostatistics, and ecology. Electives are chosen according to a student's needs and interests. Courses may be taken at Harvard Medical School, the Graduate School of Arts and Sciences, and MIT, as well as at HSPH.

Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Longwood campus. The department emphasizes publication of research results in the standard research literature, and most doctoral students publish several papers before completing the degree. The doctoral thesis is based on intensive laboratory research under the guidance of a faculty adviser in the student's area of interest. Students choose a faculty adviser whose research interests match their own when beginning to research their thesis topic. For information about schoolwide requirements for doctoral degrees, see page 5.

Limited funding is available to qualified SD students who are U.S. citizens or permanent residents. A training grant from the NIH Fogarty Institute also provides some support for international students.

Doctor of Philosophy in Biological Sciences in Public Health (Immunology and Infectious Diseases)

Students wishing to study cellular and molecular biology, immunology, virology, or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to train scientists in state-of-the-art concepts and methods in immunology, immune system disorders, virology, the biology of parasites, or important infectious diseases. For more information about the PhD program, see page 57.

Related Offerings

Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.

Contact Information

For more information about the SD program in immunology and infectious diseases or other departmental inquiries, please contact Andrea Sabaroff, administrative coordinator, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115, or visit the department website.

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas

Tuberculosis: The Host, the Organism, and the Global Threat

Survey of Immunology

Principles of Public Health Entomology

Immunology of Infectious Diseases

Cellular and Molecular Biology of Parasites

Design and Development of a Vaccine

Genetics and Genomics of Infectious Diseases: Tuberculosis, Malaria, HIV

Combating Infectious Diseases in the Developing World

Introduction to Computational Genomics for Infectious Diseases

Independent Study, Tutorials

Phone: 617-432-1023
Fax: 617-739-8348
Web: http://www.hsph.harvard.edu/departments/immunology-and-infectious-diseases

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

The GSAS application in hard copy is available at the same web address.

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Dyann F. Wirth, PhD; Richard Pearson Strong Professor of Infectious Diseases. Mechanisms of drug resistance in malaria, including molecular genetic analysis and field-based studies; genetic analysis of malaria transmission; analysis of gene expression.

Barry R. Bloom, PhD; Joan L. and Julius H. Jacobson Professor of Public Health and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases, particularly tuberculosis and leprosy; genetic analysis of host resistance; genetically engineered vaccines against tuberculosis.

Barbara Burleigh, PhD; Associate Professor of Immunology and Infectious Diseases. Molecular and cellular basis of *Tryponosama cruzi*–host cell interactions; host cell invasion; signal transduction; *Trypanosamo cruzi* differentiation.

Manoj T. Duraisingh, MSc, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular basis of the mechanisms underlying the pathogenesis of *Plosmodium falciparum* malaria; devising vaccine and drug strategies for control of the disease.

Myron (Max) Essex, MS, DVM, PhD; Mary Woodward Lasker Professor of Health Sciences. Role of retroviruses as infectious agents in AIDS; mechanisms of immunosuppression by retroviruses; African HIVs.

Sarah M. Fortune, MD; Assistant Professor of Immunology and Infectious Diseases. Host-pathogen interaction of *Mycabocterium tuberculosis*; alternative secretions systems in mycobacteria and the secretion of virulence determinants.

Laurie H. Glimcher, MD; Irene Heinz Given Professor of Immunology. Genetic regulation of the immune response; the role of 1a (class II) major histocompatibility complex molecules and T-cell receptor proteins in T-lymphocyte activation.

Michael J. Grusby, PhD; Professor of Molecular Immunology. Molecular and genetic analysis of the JAK/STAT signaling pathway.

Donald A. Harn, Jr., MA. PhD; Professor of Tropical Public Health. Regulation or direction of immune responses due to molecular composition of particular antigens; synthetic peptide and DNA vaccines for parasitic diseases.

Phyllis J. Kanki, DVM, SD; Professor of Immunology and Infectious Diseases. Pathobiology and molecular epidemiology of HIVs; characterization of immune responses and correlation to disease pathogenicity; impact of genetic variation.

Igor Kramnik, MD, PhD; Associate Professor of Immunology and Infectious Diseases. Immunology and immunogenetics of infectious diseases; diagnostic tools for predicting the susceptibility to tuberculosis in experimental models and human populations.

Tun-Hou Lee, SM, SD; Professor of Virology. Human and nonhuman primate retroviruses; vaccine design and development.

Marc Lipsitch, DPhil; Professor of Epidemiology. Theoretical, statistical, and experimental approaches to population biology and the epidemiology of infectious diseases.

Richard G. Marlink, MD; Professor of the Practice of Public Health. Clinical, epidemiological, and experimental approaches to improve HIV/AIDS prevention, care, and treatment in the developing world; role of host and virus in determining HIV outcomes.

Matthias Marti, MSc, PhD; Assistant Professor of Immunology and Infectious Diseases. Systematic analysis of virulence domains in *Plosmodium folciparum*; comparative biology of malaria parasites.

Eric J. Rubin, MD, PhD; Associate Professor of Immunology and Infectious Diseases. Genetics of tuberculosis.

Secondary Appointments

(primary appointments at Harvard Medical School)

Marcia B. Goldberg, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Characterization of the molecular mechanisms underlying the interactions of bacterial pathogens with host cells; mechanisms of bacterial cell organization relevant to virulence.

Anne E. Goldfeld, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Studies on immunopathogenesis of tuberculosis and AIDS and their integration with novel community-based approaches to treatment; TNF gene regulation.

Donald A. Goldmann, MD; Professor in the Department of Immunology and Infectious Diseases. Epidemiology of nosocomial infections; epidemiologic approaches to medical outcomes assessment and hospital quality improvement.

Daniel L. Hartl, PhD: Professor in the Department of Immunology and Infectious Diseases. Drug resistance, genetic variation, and molecular evolution of the malaria parasite; molecular evolution of bacterial antibiotic resistance.

Martin S. Hirsch, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis and therapy of human retrovirus and herpes virus infections.

Shahin Lockman, MD, SM; Assistant Professor in the Department of Immunology and Infectious Diseases. Prevention of mother-to-child HIV-1 transmission; antiretroviral therapeutics for HIV/AIDS in resource-limited settings.

Kenneth McIntosh, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis, prevention, and treatment of pediatric respiratory viral diseases; coronaviruses; new methods in viral diagnosis; epidemiology and pathogenesis of respiratory infections.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobocterium tuberculosis;* air disinfection with ultraviolet irradiation.

Edward T. Ryan, MD, DTM&H; Associate Professor in the Department of Immunology and Infectious Diseases. Enteric infections and the development of vaccines protective against such infections.

Roger L. Shapiro, MD, MPH; Assistant Professor in the Department of Immunology and Infectious Diseases. Prevention of mother-to-child HIV transmission; HIV treatment and prevention.

Joseph G. Sodroski, MD; Professor in the Department of Immunology and Infectious Diseases. Role of the HIV-1 envelope glycoproteins in virus entry; topological and structural analysis of the HIV-1 envelope glycoproteins; generation of HIV-1 neutralizing antibodies.

Adjunct Faculty

Fotis C. Kafatos, MA, PhD. Imperial College, London, United Kingdom.

Kenneth H. Mayer, MD. Brown University School of Medicine.

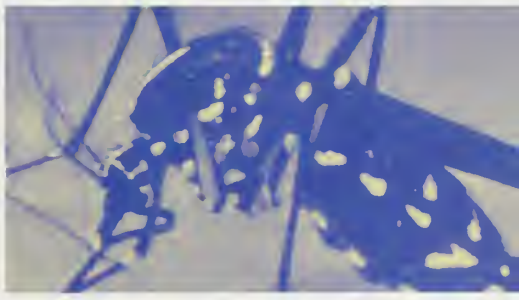
Danny A. Milner, Jr., MD. Brigham and Women's Hospital.

Thomas P.C. Monath, MD. Kleiner Perkins Caufield & Byers.

Robert L. Murphy, MD. Feinberg School of Medicine, Northwestern University.

Stephen J. O'Brien, PhD. National Cancer Institute.

Abhay R. Satoskar, MD, PhD. Ohio State University.



IDA HATOUM

Doctoral student, Department of Nutrition

When she was in the second grade, Ida Hatoum imagined that some day there would be a magic weight-loss pill. Over the years Ida has maintained a consistent interest in weight, body image, physical activity, and nutrition. While a psychology major at Boston University, and coxswain for BU varsity men's crew, Ida conducted a study examining the links between media and men's self-esteem and another study looking at the messages directed at girls reading *Seventeen* magazine. Following a year in AmeriCorps, she enrolled in the master's program in the HSPH Department of Society, Human Development, and Health: "I came here because the courses seemed very cutting edge and because I was interested in the program in women, gender, and health." Ida began working at the Massachusetts General Hospital Weight Center as a master's student and did her thesis on predictors of weight loss after gastric bypass surgery. Now a doctoral student in the Department of Nutrition, Ida's focus has evolved toward the biological basis of obesity. She calls a course on the molecular basis of metabolic disorders a "life-changing experience." One of the inaugural winners of the Pritzker Fellowship for Obesity Research, Ida plans to investigate how fat cells send signals about weight. She hopes to develop a dissertation topic that integrates her interests in nutrition, epidemiology, and biology.

DEPARTMENT OF NUTRITION

The mission of the Department of Nutrition is to improve human health through enhanced nutrition. The department strives to accomplish this goal through research aimed at improved understanding of how diet influences health, the dissemination of new knowledge about nutrition to health professionals and the public, the development of nutritional strategies, and the education of researchers and practitioners.

The Department of Nutrition provides training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are longstanding interests of the department, particularly as they concern the populations of Latin America, Africa, Asia, and the United States. Department research ranges from molecular biology to human studies of cancer and heart disease, including the conduct of population-based intervention trials. Students learn and use the latest techniques in biochemistry, physiology, biostatistics, epidemiology, and related fields. Departmental research, whether basic or applied, is relevant to human health.

Current research covers a wide range of topics, including large prospective studies of dietary factors in relation to heart disease, cancer, diabetes, and ophthalmologic disease; development of methods to assess nutritional status by analysis of body tissue; the interaction of nutritional factors with genetic determinants of disease; the interaction of nutritional factors and infectious agents; nutritional influence on blood pressure; effects of nutrition programs on the mental and physical consequences of malnutrition; nutritional determinants of blood lipid factors; lipoprotein metabolism; molecular mechanisms of diabetes and obesity; regulation of the intra- and intercellular delivery of macromolecular nutrients; and the molecular mechanism leading to atherosclerosis and thrombosis.

Degree Programs in Nutrition

As described below, the department offers two doctoral programs. The first is a program leading to the doctor of science (SD) or doctor of public health (DPH) degree in nutrition, with concentrations in either

nutritional epidemiology or public health nutrition. The second is a doctor of philosophy (PhD) program in biological sciences in public health (nutritional biochemistry/cardiovascular biology). Applicants to the PhD program who hold a clinical degree in medicine, veterinary medicine, or dentistry may prefer to follow a different curriculum leading to the SD degree in nutritional biochemistry. This option may be available by special arrangement with the department. No master's degree programs are available.

Doctor of Science in Nutrition/Doctor of Public Health

The concentration in nutritional epidemiology or in public health nutrition, leading to the SD or DPH degree, provides rigorous training in epidemiology and biostatistics as well as the biological aspects of nutrition. The overall objective of the nutritional epidemiology concentration is to enable students to investigate relationships between diet and disease. Students in public health nutrition combine behavioral sciences with biologic and quantitative approaches to design and evaluate nutrition programs, policies, and the dissemination of nutrition research.

Graduates are prepared for careers as research scientists in academic institutions, private-sector organizations, and public health agencies in state, national, and international settings. Recent graduates are now working at universities, research foundations, pharmaceutical companies, the National Cancer Institute, and the American Cancer Society.

Applicants must have a strong background in biology and mathematics. An MD or other professional health-related degree is desirable but not required. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

For the nutritional epidemiology concentration, one of the two required minors must be in epidemiology; for the public health nutrition concentration, students complete one minor in quantitative methods (biostatistics or epidemiology) and one minor in a behavioral science relevant to the development of public health programs and policies (for example, society, human development, and health). For more information on schoolwide requirements for doctoral degrees, see page 5.

Admission to a joint program with the Department of Epidemiology requires the approval of both departments, and applicants should contact the Department of Nutrition before making formal application. All students in a joint program with Epidemiology must satisfy the major requirements of both departments, complete a minor acceptable to both, and write a dissertation on a topic concerning both nutrition and epidemiology.

For the SD and DPH programs, funding may be available through the NIH-supported Training Program in Nutritional Science for students with previous doctoral degrees.

Doctor of Philosophy in Biological Sciences in Public Health (Nutritional Biochemistry/Cardiovascular Biology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program in nutritional biochemistry offers rigorous training in biochemistry, cell biology, and metabolism, allowing students to work toward solving nutritional and metabolic problems in the laboratory. Students in cardiovascular biology learn to use cutting-edge technologies from molecular biology, biochemistry, and genetics to critically dissect the mechanisms underlying cardiovascular diseases such as heart attacks,

strokes, heart failure, atherosclerosis, and congenital heart disease. For more information about the PhD program, see page 57.

Related Offerings

MPH concentration in family and community health, see page 54.
Nutritional epidemiology area of interest, Department of Epidemiology, see page 20.

Contact Information

For more information about research and training in nutrition, please contact Colleen Stover, academic services coordinator, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1851
Fax: 617-432-2435
Email: cstover@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/nutr/department

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

The GSAS application in hard copy is available at the same web address.

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Scientific Writing in Nutrition and Epidemiology

Nutritional Epidemiology I and II

Programs and Principles of Public Health Nutrition

Molecular Basis of Nutritional and Metabolic Diseases

Advanced Topics in Nutrition and Cancer

Principles of Nutrition

Science of Human Nutrition

Nutrition Seminars I and II

Advanced Topics in Nutrition II

Seminars in Food Science and Technology

Nutritional Problems of Less-Developed Countries

Research Techniques in Nutritional Biochemistry

Seminar in Nutrition and Food Policy

Nutrition/Health Promotion in the Mass Media

Developing the Applied Research Practicum in Public Health Nutrition

Applied Research Practicum in Public Health Nutrition

Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Investigation of dietary factors, using epidemiological methods, in the prevention of cardiovascular and other diseases.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Nutritional epidemiology and epidemiology of neurological diseases.

Hannia N. Campos, MS, PhD; Senior Lecturer on Nutrition. Dietary and genetic factors affecting lipoprotein metabolism and heart disease in humans; biochemical markers of dietary intake.

Wafaie W. Fawzi, MBBS, MPH, SM, DPH; Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes, particularly for prostate and colorectal cancers; methodologies to measure dietary factors in epidemiologic studies.

Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type-2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MBBS, MPH, SD; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology; molecular and genetic epidemiology.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition and Society, Human Development, and Health. Design of nutrition and activity interventions and surveillance systems in low-income, multiethnic populations; determinants of growth and weight.

Frank M. Sacks, MD; Professor of Cardiovascular Disease Prevention. Human studies of the impact of dietary fat, protein, and carbohydrates on heart disease and obesity; laboratory studies of human lipoproteins: physiology, effects on cells, and influence of diet.

Stephanie A. Smith-Warner, MS, PhD; Assistant Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk; evaluation of dietary assessment methods.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and lifestyle on health, particularly prostate cancer, other cancers, heart disease, and cognitive decline.

Eduardo Villamor, MD, MPH, DPH.; Assistant Professor of International Nutrition. Interactions between nutrition, immunity, and infection; maternal and child nutrition; auxology.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

Secondary Appointments

(primary appointments at Harvard Medical School)

Christopher P. Duggan, MD, MPH; Associate Professor in the Department of Nutrition. Oral rehydration solutions for acute diarrhea; nutritional requirements of catabolic patients; micronutrient needs in infectious and critical illness.

Matthew W. Gillman, MD, SM; Associate Professor in the Department of Nutrition. Relationship of diet to chronic conditions and diseases; early origins and early-life prevention of adult chronic diseases; disease prevention in defined populations.

Clifford W. Lo, MD, MPH, ScD; Assistant Professor in the Department of Nutrition. Vitamin D and calcium nutrition; total parenteral nutrition.

David S. Ludwig, MD, PhD; Associate Professor in the Department of Nutrition. Endocrinology; pediatric obesity.

Eric B. Rimm, SD; Associate Professor in the Departments of Epidemiology and Nutrition. Relation of diet to diseases, especially obesity, diabetes, and cardiovascular disease; impact of antioxidants, B vitamins, fiber, and alcohol.

W. Allan Walker, MPH, MD, DPH; Professor in the Department of Nutrition. Nutrition and developmental gastroenterology; nutrition and mucosal immunology; gastrointestinal immunology; protective functions of breast milk.

Adjunct Faculty

Guy Crosby, PhD. Framingham State College.

Teresa T. Fung, MS, SD. Simmons College School of Health Studies.

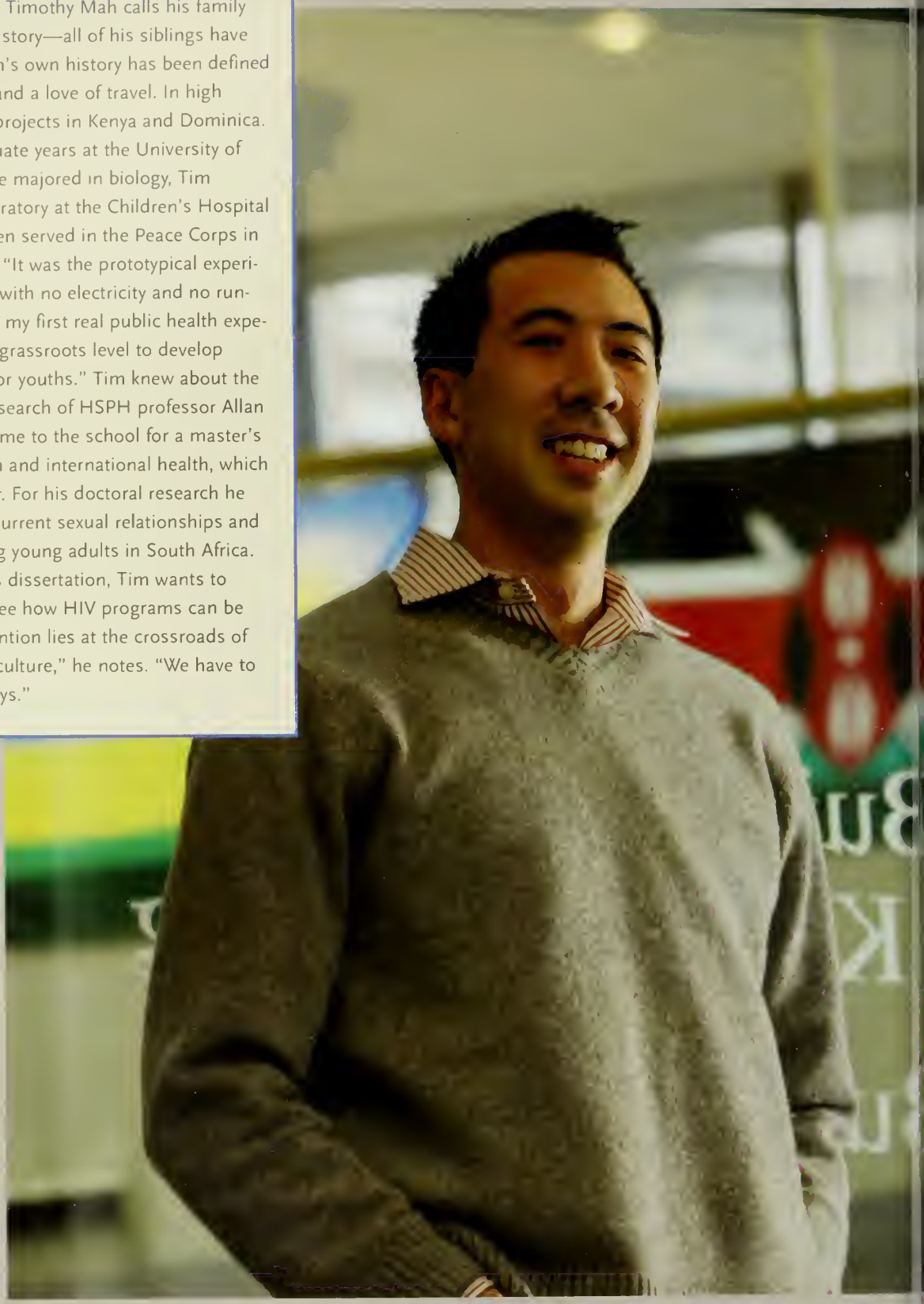
Sjúður F. Olsen, MD, MS, DMSc, PhD. University of Aarhus, Denmark.

Guy L. Reed III, MS, MD. Medical College of Georgia.

TIMOTHY MAH

Doctoral student, Department of Population and International Health

His father from China, Timothy Mah calls his family an immigrant success story—all of his siblings have advanced degrees. Tim's own history has been defined by an ethic of service and a love of travel. In high school he did service projects in Kenya and Dominica. During his undergraduate years at the University of Pennsylvania, where he majored in biology, Tim worked in an HIV laboratory at the Children's Hospital of Philadelphia. He then served in the Peace Corps in The Gambia. He says, "It was the prototypical experience of living in a hut with no electricity and no running water. It was also my first real public health experience, working at the grassroots level to develop HIV/AIDS initiatives for youths." Tim knew about the reproductive health research of HSPH professor Allan Hill and decided to come to the school for a master's program in population and international health, which he completed last year. For his doctoral research he will be looking at concurrent sexual relationships and HIV prevention among young adults in South Africa. After he completes his dissertation, Tim wants to return to the field to see how HIV programs can be improved. "HIV prevention lies at the crossroads of science, politics, and culture," he notes. "We have to find the right set of keys."



DEPARTMENT OF POPULATION AND INTERNATIONAL HEALTH

The Department of Population and International Health seeks to improve global health through education, research, and service from a population-based perspective.

The twenty-first century has arrived with complex changes in demographic patterns, disease burdens, and health policies. These changes are affecting all societies, rich and poor, developed and developing. The department's approach to these problems combines the analysis of population and health using quantitative and qualitative methods, the investigation of policies that affect health, and a concern with the politics and ethics of health and development.

The department's members generate knowledge and ideas through their research, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in the developing world. In their examination of population and international health issues, department faculty members draw on their disciplinary expertise in many areas: anthropology, biostatistics, demography, ecology, economics, epidemiology, ethics, medicine, political science, reproductive biology, and sociology. The department's research interests span a wide spectrum of topics, including social and economic development, health policy, and demography; design and financing of health care systems; women's health and children's health; prevention and control of infectious and chronic diseases; and geographic information systems (GIS). The department has a special concern with questions of health equity and human rights, particularly in relation to health and population issues in developing countries.

Students in the department come with various backgrounds. Many students are from developing countries. All have an interest in the health of disadvantaged populations worldwide.

Degree Programs in Population and International Health

As described below, the department offers both an 80-credit master of science (SM) program and a program leading to the doctor of science (SD) or doctor of public health (DPH) degree. For information on schoolwide requirements for master's and doctoral degrees, see page 5.

In addition to these programs, the department hosts postdoctoral research fellows and midcareer leaders in international health and undertakes cooperative research and intervention projects overseas.

Master of Science in Population and International Health

This 80-credit academic program prepares students for a range of careers in population and international health or can serve as a foundation for further academic training. Some recent graduates have entered doctoral programs at Harvard or elsewhere; their eventual aim is usually to work as researchers in academic institutions. Other graduates have begun careers with foundations, while others work directly for international health and development agencies, for companies, and for nonprofit and nongovernmental organizations in the United States and worldwide.

Applicants must hold a bachelor's degree or equivalent in a relevant discipline. Many entering students already hold advanced degrees in medicine or a social science discipline. The admissions committee looks for candidates with a quantitative background (some evidence of college-level courses in mathematics and statistics with calculus) and for those with relevant prior working experience in international health.

The course work for the SM degree emphasizes the acquisition of skills and concepts necessary to address a range of global population health issues. Of the necessary 80 credits, the required core courses make up roughly half, allowing considerable flexibility for students to tailor their own degree programs; 60 credits must be letter-grade credits, including a 5-credit required thesis. The remainder of the credits may be taken pass/fail.

In the first year of study, students focus on the core courses required by the school and the department. The foundation course on population and international health, offered in the first semester, is taken by all students and provides a common platform for the

more advanced work that follows. There are approximately 35 required credits in the first year of study, including schoolwide requirements; courses in demography, population health measurement and risk factors, reproductive health, and ethics; and applied courses in politics and economics. In the summer after the first two semesters of instruction, students are expected to develop their ability to apply their skills and knowledge to contemporary problems in international health by undertaking an internship in the United States or abroad. Students often use this internship and the opportunities it provides to gather information for their thesis. In the WinterSession (January each year), many students join one of the faculty-directed field courses, which in recent years have included work in Palestine, India, Bangladesh, China, and Chile.

The second year involves a combination of course work and independent study, some linked to the thesis. Individual contracts for independent study with faculty members in the school or the university are encouraged in this second year of study. Many students choose to take courses in other Harvard faculties such as the Kennedy School of Government or the Graduate School of Arts and Sciences. Since students have fewer required courses in the second year, they can specialize in areas of their choice.

The instruction provided through the courses, field visits, and individual or small-group teaching is largely based on the first-hand current research experience of the faculty, who work on a range of applied and theoretical problems in population and international health. The graduating student thus has a solid and up-to-date understanding of the major issues in population and global health, the tools to examine evidence related to priority setting and decision making, and insights into the practical aspects of making population health interventions around the world, including a perspective on the economic, social, political, and ethical considerations that bear on these issues.

Doctor of Science in Population and International Health/Doctor of Public Health

The doctoral programs are designed to prepare students both for professional leadership positions in the public or private sectors of public health and for academic careers in universities or research institutions. Recent graduates have taken positions with the Centers for Disease Control and Prevention, the World Bank, and nongovernmental organizations and have assumed postdoctoral and teaching positions with universities in the United States and around the world.

Desired applicants have outstanding academic records, substantial relevant experience in the international public health arena, and professional interests relevant to the department. Applicants to the DPH program must hold an MPH and a prior doctoral degree. Though not required for the SD program, a master's degree is strongly recommended. Students are encouraged to enter the department's 80-credit master's degree program and apply to enter the doctoral program at a later date. Entry to the doctoral program will then depend upon outstanding performance in the master's degree program and acceptance through the regular doctoral program admission process.

In addition to schoolwide requirements, doctoral students must complete a common core of course work with a focus on global health. The core course work is completed in the first year. Core courses cover economics, ethics, politics, quantitative and qualitative methods, and population health measurement. The second year of the doctoral program usually involves both course work and research planning.

Applicants to the doctoral program must select one of three areas of interest currently offered by the department: economics, health systems, or population and reproductive health. The selected area becomes the student's required major for the doctoral program. Although course requirements for a specific area of interest may be taken concurrently with the core, the majority of these will be taken during the second year of study. The two required minor fields may be chosen from the department or from allied departments of the school or university, including the HSPH Departments of Biostatistics, Epidemiology, Immunology and Infectious Diseases, Nutrition, or Society, Human Development, and Health.

The three areas of interest offered by the department are described below:

Economics The economics area of interest is designed to give students a strong foundation in microeconomic theory and to develop their skills in applying economic analysis to issues in population and international health. In addition to economic theory, students will also study recent empirical economic research on population and international health issues. The rigorous training provided in this area of interest, together with interdisciplinary training in other areas, will allow students to undertake their own research using economic models of behavior. While the required courses for this area can be completed in two years, it is recommended that students take additional advanced courses during their third year in the Department of Economics in the Harvard University Faculty of Arts and Sciences.

Research topics that might be pursued within the economics area of interest include the costs and benefits of public health interventions, the effect of poverty and social deprivation on health, the impact of health improvements on the economy, the effect of government regulation on market structures and private health care provision, mechanisms for developing new drugs and treatments, and the effect of family size on child poverty and health.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries

Ethical Basis of the Practice of Public Health

Introduction to the Practice of International Health

Financing Health Care in Developing Countries

Justice and Resource Allocation

Program Evaluation of Public Health Programs

Ethics and Health Disparities

Public Health Response to Mass Emergencies

Managing Community Health Centers

Business Planning for Health Organizations

Management Control in Health Organizations

Health, Human Rights, and the International System

Health and Human Rights: Concepts and Methods for Public Health

Introduction to Demographic Methods

Health Sector Reform: A Worldwide Perspective

Planning and Evaluation of Health Programs

Human Ecology

Frontiers of Knowledge in HIV/AIDS Prevention, Care, and Research

Models of Complex Systems in Biology and Public Health

Grant Writing for Funding of Research and Health Care Projects

Ethical Issues in International Health Research

HIV/AIDS in Developing Countries: Epidemiology and National Responses

Field Experience in Health and Human Rights

Applied Politics and Economics: Political Economy of International Health

Foundations of Global Population and Health

Applied Quantitative Methods

Pharmaceutical Policy and Global Health

Issues in Health and Human Rights

Microeconomics and Applications to Public Health in Developing Countries

Individual and Social Responsibility for Health

International Health Economics I and II

Human Security and Development Planning in Middle East: Field Study

Field Trip: Health Reform and Community Medicine in Chile

Field Trip: Kerala, India

Research Methods in Population

International Reproductive Health Issues: From Theory to Practice

Determinants of Fertility and Mortality

Applied Quantitative Methods of International Health Research

Sex, Reproduction, and Reproductive Health

Measuring Population Health

Population Health Risk Factors—Introductory and Advanced Seminar

Humanitarian Protection in Conflict: Legal and Policy Challenges

Public Health Operations in Complex Emergencies and War

Public Health and Security Management

Humanitarian Studies in the Field

International Perspectives on Intimate Partner Violence and Public Health

Ecology of Health in Development

Disease Control in Developing Countries: Intervention Priorities

Econometrics for Health Policy

Geography of Infectious Diseases

Analysis Using Demographic and Health Survey Data

Field Trip: Urban and Rural Bangladesh

Health System Reforms in China: Seminar and Field Study

Field Trip: Brazil

Independent Study, Tutorials

Health systems The health systems area of interest trains students to apply a multidisciplinary approach to advanced research on health care systems. The focus of this area is to develop new knowledge to improve the design, implementation, and evaluation of strategies to improve health and equity in middle- and lower-income countries through better health system performance. Through course work and applied research, students will learn to integrate theories and methods from economics, political science, ethics, and management and administration and to apply them to the critical international health system issues of the day.

Examples of research topics in this area of interest might include the impact on national health spending of changes in health system organization, the effect of decentralization on priority health service programs, consumer response to characteristics of public and private health care providers in developing countries, and evaluation of strategies to improve administrative and management efficiency in government services.

Population and reproductive health The population and reproductive area prepares students for independent research on population health issues worldwide. Through required courses, seminars, and independent study, the area provides a solid foundation in the essential demographic, epidemiologic, and statistical concepts and methods needed for the analysis of levels, trends, and differentials in population health and its determinants. A key element of the training is grounding in methods for the measurement of fertility, mortality, and morbidity levels and their biological, environmental, and behavioral determinants, including health risk factors. Several courses illustrate the way in which methods and models based on demographic estimation techniques and epidemiologic relationships can be applied to new challenges in national, regional, and global burden of disease assessments. The training is strongly quantitative, with an emphasis on analytical techniques, but competence in the application of qualitative methods and an understanding of the broader socioeconomic and anthropological theories of population health is also expected.

Students within this area have recently written dissertations on such topics as HIV/AIDS in Tanzania, gender-based violence and reproductive health in Jordan, risk factors for the global burden of chronic diseases, causes and consequences of induced abortion in Ghana, and intergenerational factors in child growth and health in rural Africa.

Postdoctoral Fellowships

The Takemi Program offers postdoctoral fellowships for professionals and scholars from around the world for research and advanced, interdisciplinary training on critical issues of international health, especially those related to developing countries. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. The program can fund a limited number of fellowships each year and can assist in identifying external sources of funding, which applicants are encouraged to pursue.

Related Offerings

MPH concentration in international health, see page 54.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
Interdisciplinary concentration in women, gender, and health, see page 58.

Contact Information

For general information about the Department of Population and International Health, please contact the department at 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1232
Fax: 617-432-6733

For more information about master's and doctoral programs in population and international health, please contact the Education Office, Department of Population and International Health, at the address above, or visit the department website.
Phone: 617-432-2253
Fax: 617-432-6733
Email: ajaimung@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/pih/index.htm

For more information about the Takemi Program in International Health, please contact the program coordinator, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-0686
Fax: 617-432-1251
Email: takemi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/takemi

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: David E. Bloom, MA, PhD: Clarence James Gamble Professor. Applied microeconomics: labor, population, health, development, and environment, demography.

Theresa S. Betancourt, MA, SD; Assistant Professor of Child Health and Human Rights. Psychosocial impact of complex humanitarian emergencies on children and families; resilience and protective processes in children facing adversity; applied cross-cultural mental health research.

Barry R. Bloom, PhD: Joan L. and Julius H. Jacobson Professor of Public Health and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

Thomas J. Bossert, MA, PhD: Lecturer on International Health Policy. Health systems research in low- and middle-income countries, especially on decentralization, politics of health reform, organizational change, human resources, and social capital.

Claude Bruderlein, Lic.en Droit, LLM: Lecturer on International Health. Human rights and humanitarian law; protection of civilians in war; role of international institutions in humanitarian intervention.

Paul H. Campbell, MPA, SD: Lecturer on Management. Community health centers; long-term care and primary care re-engineering; health system issues, including human resource development in developing countries.

David J. Canning, PhD; Professor of Economics and International Health. Economic development, particularly the role of health and demography in economic growth.

Richard A. Cash, MD, MPH: Senior Lecturer on International Health. Epidemiology and policy issues of infectious diseases in developing countries; ethical issues in international health; health systems and health equity in developing countries.

Marcia C. Castro, MA, PhD; Assistant Professor of Demography. Population dynamics and demographic methods; mortality and morbidity; malaria transmission and control; environmental change and health; spatial methods applied to social sciences; Amazon frontier expansion.

Norman Daniels, MA, PhD: Mary B. Saltonstall Professor of Population Ethics and Professor of Ethics and Population Health. Ethics and health care.

Majid Ezzati, MEng, MA, PhD; Associate Professor of International Health. Environmental health in developing countries, energy, air pollution, and health risk assessment, population health, global health; technology policy.

Sofia M. Gruskin, JD, MA: Associate Professor of Health and Human Rights. Health and human rights; determining the value of human rights for public health effectiveness; integrating human rights into program design and implementation.

Allan G. Hill, PhD: Andelot Professor of Demography. Demography of the Middle East and West Africa; health transition studies; measurement of health status and differentials; women's health; geographical differentials in urban health.

Saidi H. Kapiga, MD, MPH, SD: Associate Professor of Reproductive Health. Development and assessment of community-based HIV and STD control programs; development and testing of interventions to reduce perinatal transmission of HIV.

Jennifer Leaning, SM, MD: Professor of the Practice of International Health. Medical human rights and international law; complex humanitarian emergencies, medical triage in war and disasters, environmental effects of war.

Richard Levins, PhD: John Rock Professor of Population Sciences. Human ecology; viability of populations and environments, with special interest in the Caribbean region; complexity; qualitative mathematics; philosophy of science.

Yuanli Liu, MD, MPH, SM, PhD: Senior Lecturer on International Health. Equity in health care; health care financing in developing countries; Chinese health care system; interaction of health and social security systems.

Ajay Mahal, MS, PhD; Assistant Professor of International Health Economics. Economic implications of the AIDS epidemic; health financing in India; human rights and economic analysis.

Stephen P. Marks, Doctorat d'état, François-Xavier Bagnoud Professor of Health and Human Rights. Human rights; international law; international institutions; international affairs; development; biotechnology; international criminal law; terrorism, cultural rights.

Marc D. Mitchell, MD, MS: Lecturer on International Health. Management of health care programs in developing countries.

Michael R. Reich, AM, PhD; Taro Takemi Professor of International Health Policy. Political economy of health, population, and development; pharmaceutical policy and global health.

Joshua A. Salomon, PhD: Associate Professor of International Health. Priority setting in global health; health measurement and valuation; evaluation of impact and cost-effectiveness of health programs and interventions.

Daniel Wikler, PhD: Mary B. Saltonstall Professor of Population Ethics and Professor of Ethics and Population Health. Ethics and population and international health, priority setting in health care, ethical issues in international health research.

Secondary Appointments

(primary appointments at Harvard Medical School or Kennedy School of Government)

Jonathan L. Burstein, MD: Assistant Professor in the Department of Population and International Health. Emergency medicine in the field, hospitals, and disaster situations.

Jim Yong Kim, MD, PhD: François-Xavier Bagnoud Professor of Health and Human Rights. Responses to HIV/AIDS and tuberculosis and access to pharmaceuticals in developing countries, global health policy; medical anthropology.

Mary E. Wilson, MD: Associate Professor in the Department of Population and International Health. Emerging infectious diseases.

Grace Wyshak, SM, PhD: Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods, women's reproductive health.

Adjunct Faculty

Peter A. Berman, MSc, PhD. World Bank.

Joel H. Lamstein, SM. John Snow, Inc.

Ulla M. Larsen, MA, MA, PhD. University of Maryland.

Alan D. Lopez, MS, PhD. University of Queensland, Australia.

Adetokunbo O. Lucas, MBBS, DPH, SM, MD. Consultant.

Christopher J. L. Murray, MD, DPhil. University of Washington.

M. Omar Rahman, MD, MPH, SD. Independent University of Bangladesh.

Amartya K. Sen, MA, PhD. Cambridge University, United Kingdom.

Gita Sen, MA, PhD. Indian Institute of Management Bangalore, India.

DEANA WAGNER

Master's student, Department of Society, Human Development, and Health

Deana Wagner grew up in the tiny town of Caney, Kansas, not far from her Cherokee relatives in Locust Grove, Oklahoma. Deana was a community health major at Brown University. She says, "I thought about becoming a doctor, but I saw a real split between the medical students and the community health students. I wanted more public health involvement." Deana also became deeply engaged with the student group Native Americans at Brown; she helped to establish the university's annual powwow and develop Native American studies courses. After Brown, under the aegis of Teach for America, Deana spent two years teaching high school science to members of the Oglala Lakota tribe on the Pine Ridge Indian Reservation in Kyle, South Dakota. "Keeping students motivated and involved was often challenging, but I wanted them to hear about college and other opportunities," she recalls. (Seven of Deana's students received Gates Millennium Scholarships.) Seeing firsthand the connection between health and education, she came to HSPH for master's training in the Department of Society, Human Development, and Health. Deana plans to complete a doctoral degree at HSPH and then to work with her own tribe, the Cherokee Nation of Oklahoma. In the longer term she hopes to return to the Pine Ridge Indian Reservation.

DEPARTMENT OF SOCIETY, HUMAN DEVELOPMENT, AND HEALTH

The mission of the Department of Society, Human Development, and Health (SHDH) is to improve health throughout the lifespan, including a special emphasis on children and adolescents. This mission is achieved through research to identify the social and behavioral determinants of health, development and evaluation of interventions and policies leading to the improvement of population health, and the preparation of professionals and researchers who will fill leadership positions in advocacy and public service.

The department's educational mission is to train both scholars and practitioners: scholars whose research will illuminate basic social determinants of health and who will identify and test innovative social policy and service interventions; practitioners who are skilled in designing, implementing, and evaluating health-enhancing interventions in action settings.

The department highlights four areas of interest:

Health and social policy A wide range of social policies—including but not limited to labor, poverty, family, housing, and educational policy—have a dramatic impact on health. This area of interest prepares students to design new and improve existing social policies and focuses on strategies for the successful implementation of social policies that improve health. Students who study in this area may be interested in working on public policy through research, within the government, or in a nonprofit organization.

Human development The department's emphasis on human development across the life course results from faculty research and interest in three domains: the physical, mental, and behavioral health and well-being of children and adolescents; basic developmental processes (including physical growth, nutrition, and psychological development); and growing attention to the impact of early-life conditions on long-term health and functioning. Course work in this area of interest includes material on physical growth and development, principles of psychological and social development, and

longitudinal research methods. Research conducted by faculty members involves longitudinal studies of both at-risk and community samples, emphasizing cumulative risk and protective influences across the lifespan and implications for prevention, early intervention, and treatment strategies.

Planned social change This area of interest focuses on the application of theory in the design of intervention programs, as well as on research and evaluation methodology. The area includes work on interventions using randomized clinical trial designs and quasi-experimental approaches. Attention is given to the following design steps: problem diagnosis, assessment, formative research, program design, and evaluation. The social settings for interventions may be communities, workplaces, schools and colleges, and health care facilities. Populations of interest include those who are underserved, marginalized, and in special need. Intervention strategies include educational interventions, community organizing and development, social marketing, communication, adult-learning approaches, and advocacy.

Social determinants of health This area of interest emphasizes the analysis of the major social conditions that affect the health of populations. Research stresses socioeconomic position, social and economic inequality, discrimination, social networks and support, social capital, work conditions, and psychological states. Seminars, tutorials, and courses enable students to explore a range of the health consequences of various social factors by studying varied subgroups, at different times and places and under diverse and changing conditions. Students examine mechanisms and processes through which social factors exert their impact, and also investigate mechanisms that mediate or moderate relationships between social factors and health outcomes.

Degree Programs in Society, Human Development, and Health

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, a dual-degree master's program for nurses and social workers, and a doctoral program leading to the doctor of science (SD) or doctor of public health (DPH) degree. Students in all degree programs may follow the SHDH concentration in maternal and child health (MCH) and/or an interdisciplinary concentration in women, gender, and health. Within the doctoral and 80-credit master's programs only, students may follow a concentration in health communication. For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Science in Society, Human Development, and Health (80-credit and 42.5-credit programs)
The 80-credit, professional SM program prepares students for a variety of positions in community, public, and private settings. These roles include the design, management, and evaluation of programs, particularly health promotion and disease prevention programs, health communication programs, and those providing services to women, youth, and children. Other roles include work in research, public policy, and advocacy. Students in the MCH concentration are prepared for careers in maternal and child health practice, research, planning, policy development, and advocacy. The health communication concentration is especially intended for those who seek positions as independent researchers and scholars; public health communicators in the private sector, state and federal agencies, international agencies, and nonprofit organizations; and public health leaders who require communication skills.

Recent graduates have taken such positions as the evaluator on a violence prevention program for adolescents, associate director of public health and research at Georgetown University, assistant medical director of the Rhode Island Health Department, and intern in the Presidential Management Program, Office of the Budget for Health and Human Services; others have gone on to earn doctoral degrees.

Applications are encouraged from students who have a strong social sciences and/or natural sciences background, public health experience, and defined public health goals. Solid mathematics and writing skills and successful experience with course work requiring critical reading and writing, drawing of inferences, and rigorous analysis are crucial. Previous graduate work is not required.

Students must earn at least 20 credits in departmental courses. They are not required to declare an area of interest within the department but are encouraged to take course work in all four. In addition to fulfilling HSPH, SHDH, and practice core requirements, students are expected to delineate professional goals and to develop an area of expertise. They often focus on a subject area (such as AIDS; addiction; cardiovascular or cancer risk reduction; the health of children, adolescents, or women; and mental health) and/or a skill area (such as program design and evaluation, communication, policy analysis, or marketing). Students must complete a practicum, which consists of skill development in a practice setting, two seminars, and a final paper.

Students in the MCH concentration elect one of two focus areas, each of which has specific requirements in addition to the basic master's degree curriculum. The MCH epidemiology focus is for those wishing to develop research skills for work in research, advocacy, or policy organizations; the MCH program planning and policy focus is geared toward those interested in policy formulation or program design and management. In the health communication concentration, students must take a core course on theories of health communication, a course on health communication in applied settings, and one on advanced topics.

The 42.5-credit SM program is intended to prepare students for research careers in public and private agencies. Applicants eligible for the 42.5-credit program are established practitioners or investigators holding prior master's or doctoral degrees in the social/behavioral sciences, health care, or a public health field. Students in this program must fulfill the schoolwide requirements and earn 15 credits in departmental courses. They should work closely with their advisers to develop a study plan to meet their particular academic and career goals.

Master of Science in Society, Human Development, and Health (HSPH 42.5-credit program) and Master of Science in Parent-Child Nursing or Women's Health, or Master of Social Work (Simmons College)
These professional, dual-degree programs, which require that 42.5 credits be earned at HSPH, are designed to prepare nurse practitioners and social workers for leadership roles in public and private institutions serving children and their families. Recent graduates have taken such positions as director of clinical services for the Family Planning Association of Maine and staff director for the World Health Organization Maternal Health and Safe Motherhood Program.

Applicants should have a relevant bachelor's degree and the equivalent of at least three years of relevant experience. International applicants with equivalent degrees and experience are eligible to apply. International nurses must have equivalent licensure. Applicants must also meet the general admission requirements of both HSPH and Simmons College.

Students enroll in half-time study at both Simmons College and HSPH for two academic years, in addition to studying at Simmons for one summer session. See the department's Curriculum and Advisory Guide for degree requirements. Continued matriculation is dependent on maintaining satisfactory academic progress in both programs.

Doctor of Science in Society, Human Development, and Health/Doctor of Public Health

The doctoral program provides a common core education addressing issues of society, human development, and health at the same time as developing expertise in one of the four previously described areas (health and social policy, human development, planned social change, and the social determinants of health). Students must select an academic focus in one of the four areas of interest. Students in the MCH concentration complete the normal requirements for the doctoral program. They choose one of the four areas of interest as a focus and must complete either a major (preferred) or a minor in MCH. All students should consult the department's Curriculum and Advising Guide for a listing of required courses.

Current and recent doctoral students in the department have undertaken dissertation research projects on the following topics: socioeconomic position, allergic disease, and cancer risk; cross-national comparisons of perinatal care technologies on neonatal survival; poverty, policy, neighborhoods, and health; effectiveness of public policies for children with disabilities; social influences on health behaviors of college students with same-sex experience; depressive symptoms in postpartum women; gender inequality and health; measurement and social and physical contexts of physical activity; and cost-effectiveness of lead-poisoning prevention programs.

Recent graduates have taken such positions as Epidemic Intelligence Service officer at the Centers for Disease Control and Prevention (CDC) in Atlanta, postdoctoral fellow at the National Development and Research Institute in New York, research scientist at Harvard University, project officers in philanthropic foundations, and assistant professors at schools of public health and medical schools. Graduates are pursuing careers in academia, government, and nonprofit organizations as leading researchers, teachers, policymakers, and program developers, such as chair of a department of obstetrics in Taiwan and chief of the lead-poisoning branch at the CDC.

Most students enter the doctoral program with a strong foundation in the social, behavioral, clinical, public health, or natural sciences and with an earned master's degree in a social science (such as sociology, psychology, economics, political science, public policy, and anthropology); clinical health (such as nursing and social work); public health (such as epidemiology and health education); or natural sciences (such as biology, physiology, and neurosciences).

For the SD the department accepts a small number of students without a master's degree directly into the program. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

Limited funding is awarded on a competitive basis to qualified applicants in both master's and doctoral programs. Two training grants from the Maternal and Child Health Bureau support students in the MCH concentration. A fellowship for doctoral students is available in the area of cancer prevention, and some doctoral fellowships may also be available for underrepresented minorities. A limited number of universitywide presidential fellowships are awarded on a competitive basis to underrepresented minorities and to students from developing countries who are planning on public service or academic careers. Students receive funding in other areas through research assistantships and their own grant applications.

Related Offerings

Interdisciplinary concentration in women, gender, and health, see page 58.
MPH concentration in family and community health, see page 54.

Contact Information

For more information about research and training in Society, Human Development, and Health, please contact Elizabeth Solomon, assistant director for academic affairs and fellowship programs, Department of Society, Human Development, and Health, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-3761
Fax: 617-432-3755
Email: esolomon@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/shdh

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Physical Grawth and Develapment

Nutritian in Child Grawth and Develapment

Social Epidemialogy

Practice of Family and Community Health II

Mental Health of Children and Adalescents

Media and Health Cammunication: Practical Skills

Saciety and Health

Communication in Health Care Settings

Race, Ethnicity, and Health: Perspectives fram Social and Behavioral Sciences

Adalescent Health

Women, Health, and Development: Reconciling Science and Palicy

Health Pramation Through Mass Media

Developmental Disabilities I: Evaluatian, Assessment, and Systems

Develaping Radia Communications

Developmental Disabilities II: Value, Palicy, and Change

Histary, Politics, and Public Health: Thearies af Disease Distributian

Childbirth Health Policy and Epidemiology

High-Risk Behaviar: Epidemialagy and Prevention Strategies

Society and Its Effects on Child Health

Psychosocial Theories af Health and Health Behavior

Social Services far Children, Adolescents, and Families

Services far Children with Disabilities

Future Health Communicatian: New Media and Emerging Technalagies

Community Interventian Research Methods

SHDH Department Praseminar

Public Health Genetics: Cantemparary Issues and Challenges

Qualitative Research Methods for Public Health

Practice af Preventing Intimate Partner Violence

Sacial Policy and Legal Dilemmas: Child Custody and Visitatian

Applied Methods for Secondary Data

Sacial and Behavioral Research Methods I

Issues in MCH Programs and Policies

Approaches to Internatianal Tabacco Control and Public Health Practive

Stress and Health

SHDH Master's Seminar

Multilevel Statistical Methads: Cancept and Application

Program Planning: Design and Evaluation

Dactaral Seminar an Saciety, Human Develapment, and Health

Innovative Strategies in Health Education

Health Literacy

Society, Human Development, and Public Health

Methods for Research on Social and Behavioral Dimensions of Public Health

Personality and Cognitive Development: Applicatian ta Public Health

Policy Analysis Methods for Public Health

MCH Seminar

Place, Migration, and Health

Practicum Project Planning and Evaluation

Health and Sacial Palicy Dactaral Seminar

Leadership in Minority Health Policy

Issues in Minority Health Policy

Clinical Effectiveness Seminar

Independent Study, Tutorials

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2007–08.

Department chair: Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

Dolores Acevedo-Garcia, MPA, PhD; Associate Professor of Society, Human Development, and Health. Racial/ethnic disparities in health; immigration and health; health and social development of children with special needs; social policy.

Elizabeth M. Barbeau, MPH, ScD; Associate Professor of Society, Human Development, and Health. Workplace health and safety policy; work-site cancer prevention; tobacco policy; health inequalities.

Gary G. Bennett, MA, PhD; Assistant Professor of Society, Human Development, and Health. Social determinants of racial/ethnic disparities in cancer risk behaviors, particularly obesity and physical inactivity; community-based intervention research; racial discrimination and the health of blacks.

Gregory N. Connolly, DMD, MPH; Professor of the Practice of Public Health. Impact of policies restricting smoking; structure and marketing practices of the tobacco industry; analysis of internal tobacco industry documents; tobacco product design and use.

Felton J. Earls, MD; Professor of Human Behavior and Development. Longitudinal research to understand how community, family, and individual factors influence delinquent and criminal behavior.

Karen M. Emmons, MA, PhD; Professor of Society, Human Development, and Health. Cancer prevention; disparities; smoking and health effects of environmental tobacco smoke; health care and community-based interventions.

Stephen E. Gilman, SM, SD; Assistant Professor of Society, Human Development, and Health. Social epidemiology of psychiatric disorders; health disparities and the life course.

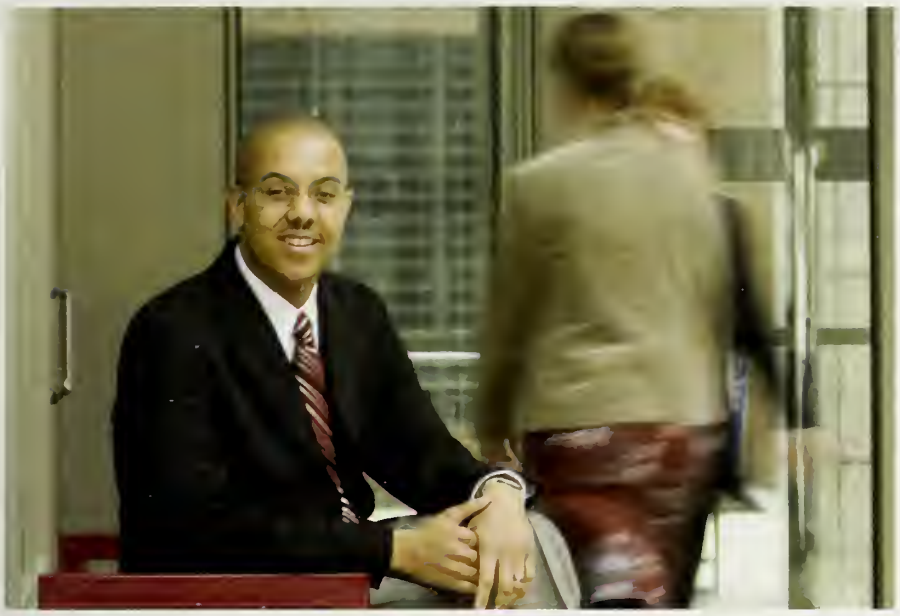
Steven L. Gortmaker, MS, PhD; Professor of the Practice of Health Sociology. Statistical evaluation methods; socioeconomic position and child health; developing and evaluating social, behavioral, environmental, and policy influences on obesity and other chronic conditions.

Ichiro Kawachi, MD, PhD; Professor of Social Epidemiology. Social inequalities in health, especially related to income distribution; stress and cardiovascular disease; quality of life and healthy aging; tobacco control.

Karestan C. Koenen, MA, PhD; Assistant Professor of Society, Human Development, and Health. Psychological trauma; posttraumatic stress disorder; developmental psychopathology; psychiatric genetics.

Nancy Krieger, MS, PhD; Professor of Society, Human Development, and Health. Social inequalities in health, especially regarding race/ethnicity, social class, and gender; cancer, especially breast cancer; cardiovascular disease, especially hypertension.

Laura D. Kubzansky, MSc, PhD, MPH; Associate Professor of Society, Human Development, and Health. Psychosocial determinants of health; social inequality and health; emotion and cardiovascular disease.



Marie C. McCormick, MD, ScD; Sumner and Esther Feldberg Professor of Maternal and Child Health. Infant mortality; outcomes of high-risk neonates and interventions to ameliorate adverse outcomes.

Beth E. Molnar, SM, SD; Assistant Professor of Society, Human Development, and Health. Prevention of child abuse, neglect, and their associated sequelae; causes and prevention of child and adolescent high-risk behavior and mental disorders.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition and Society, Human Development, and Health. Design of nutrition and activity interventions and surveillance systems in low-income, multiethnic populations; determinants of growth and weight.

Rima E. Rudd, MS, ScD; Senior Lecturer on Society, Human Development, and Health. Health literacy; health communication; program planning and evaluation; public health and adult education pedagogy; social marketing.

Jack P. Shonkoff, MD; Julius B. Richmond FAMRI Professor of Child Health and Development. Early-childhood policy; childhood roots of disparities in health and learning; development and translation of the science of health, learning, and behavior.

Jay G. Silverman, MS, PhD; Associate Professor of Society, Human Development, and Health. Health effects and prevention of gender-based violence against adolescents and adult women, including intimate partner violence, sexual assault, and sex trafficking

Glorian Sorensen, MPH, PhD; Professor of Society, Human Development, and Health. Cancer prevention in the workplace; intervention research in community and occupational settings.

S. V. Subramanian, MA, MPhil, PhD; Associate Professor of Society, Human Development, and Health. Social and contextual determinants of health, with special emphasis on asthma; application of multilevel methodologies for complex data structures.

Kimberly M. Thompson, MS, SD; Associate Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as life-saving devices; applications of value of information techniques to environmental health decisions.

Kasisomayajula Viswanath, MA, PhD; Associate Professor of Society, Human Development, and Health. Mass media and public health; communication inequities and health disparities; risk communication; new media developments in health communication.

David R. Williams, MPH, MA, PhD; Florence Sprague Norman and Laura Smart Norman Professor of Public Health. Socioeconomic and racial/ethnic variations in health; racism and health; psychosocial factors and mental health; religion and health.

Secondary Appointments

(primary appointments at Harvard Medical School)

S. Bryn Austin, SD; Assistant Professor in the Department of Society, Human Development, and Health. Environmental influences on nutrition, physical activity, and eating disorders in adolescents; sexual orientation disparities in health.

Allen C. Crocker, MD; Associate Professor in the Department of Society, Human Development, and Health. Chronic illness and developmental disabilities in children; mechanisms of disability.

Barbara Gottlieb, MD, MPH; Associate Professor in the Department of Society, Human Development, and Health. Women's health; unintended pregnancy; depression; minority and community health; adolescent and school health.

Jennifer S. Haas, MD, SM; Associate Professor in the Department of Society, Human Development, and Health. Disparities in health and health status; the role of neighborhood characteristics on health behaviors and outcomes; prescription drug policy.

Charles J. Homer, MD, MPH; Associate Professor in the Department of Society, Human Development, and Health. Application of epidemiologic methods to assess the effectiveness of health care services.

Ellice S. Lieberman, MD, MPH, DPH; Professor in the Department of Society, Human Development, and Health. Perinatal epidemiology; risk factors for adverse pregnancy outcomes; assessment of new technologies and care practices in obstetrics.

Judith S. Palfrey, MD Professor in the Department of Society, Human Development, and Health Development of preschool children interface of health and educational services for children.

Joan Y. Reede, MD, MPH, SM: Associate Professor in the Department of Society, Human Development, and Health. Biomedical manpower and academic research career development; health services to and impact of health policy on minority and other populations.

Michael O. Rich, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Children's health and communications media; the illness experience from the patient's perspective.

Benjamin P. Sachs, MBBS, DPH; Professor in the Department of Society, Human Development, and Health. Epidemiology and health policy relating to women and children in technological evaluation, infant mortality, and medical services.

Edward C. Tronick, MS, PhD; Associate Professor in the Department of Society, Human Development, and Health. Neurodevelopment of infants and children exposed to drugs in utero; depressive symptoms and mother-infant interaction.

Rosalind J. Wright, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Stress and health; asthma disparities; social determinants of lung disease.

Adjunct Faculty

Jennifer D. Allen, SD. Boston College School of Nursing.

Robin J.R. Blatt, MPH. Applied Biogenuity Consultants.

Mary Jean Brown, SM, SD. National Center for Environmental Health.

Stephen L. Buka, SM, AM, SD. Brown University.

Johanna T. Dwyer, MS, SM, SD. Tufts Medical Center.

Michael L. Ganz, MS, MPhil, PhD. Abt Associates, Inc.

Roberta E. Goldman, MA, PhD. Boston University School of Medicine.

David T. Helm, MA, PhD. Children's Hospital Boston.

Daniel J. Kindlon, MS, PhD. Consultant.

Lawrence C. Kleinman, MD, MPH. Quality Matters, Inc.

Michael G. Marmot, MBBS, MPH, PhD. University of London, United Kingdom.

Norma M. Swenson, MPH. Consultant.

Lisa Tieszen, MA. Beth Israel Deaconess Medical Center.

Deborah K. Walker, EdM, EdD. Abt Associates, Inc.

STANDARD OF HEALTH I
OF THE FUNDAMENTAL

LUIS CASTELLANOS

Master of public health student

Luis Castellanos and his family moved back and forth between Mexico and California several times during his childhood. His family finally settled in Modesto, California, where Luis went to high school. "I was automatically placed in the technical track," he says. "But I knew that welding was not what I wanted to do with my life." A sympathetic guidance counselor switched him into college preparatory classes and encouraged him to apply to the University of California, Davis. Luis first studied engineering at UC Davis, but the experience of volunteering as a translator in a Modesto health clinic changed his mind: "It was amazing to me that I could do something important for those patients. I realized I could do much more if I could learn the skills to practice medicine." After earning his undergraduate degree in biochemistry, Luis attended Harvard Medical School, then completed a residency in internal medicine at the University of California, San Diego, Medical Center. "In San Diego I observed that Hispanics and African Americans did not receive the same standard of care as whites. I decided I wanted to learn how to treat a community," he remarks. Now an MPH student and Commonwealth Fund/Harvard Fellow in Minority Health Policy, Luis plans to practice academic medicine and develop strategies that will reduce cardiovascular risks for underserved populations.

MASTER OF PUBLIC HEALTH PROGRAM

The Master of Public Health (MPH) degree is the most widely recognized professional credential for leadership in public health. The program emphasizes active, student-directed learning, problem solving, and the acquisition of skills essential to the practice of public health. The program is organized around seven career-oriented concentrations (see below). In addition to the common core curriculum, each concentration offers specialty electives and a selection of areas of interest, allowing students to explore in depth one or more spheres of relevance to their career goals. The concentrations and areas of interest enable students in the interdisciplinary MPH program to establish a second "home" in one of the school's academic departments, such as Health Policy and Management or Population and International Health.

Coming from all parts of the world, MPH students bring a wide variety of backgrounds and experiences to the program. The majority of these students are health professionals, with a minimum of three to five years of work experience, who are preparing for advancement in their organizations or for transition into new fields. The MPH program is geared toward professionals who hold a doctoral degree (or foreign degree equivalent) in medicine, dentistry, veterinary medicine, law, or other fields related to public health—for example, biology, other natural sciences, behavioral sciences, or social sciences. Individuals with a master's degree in nursing, social work, business administration, or a field closely related to public health (see above) and who have at least three years of health-related work experience may also be considered for admission to the program. Preference is given to applicants with clearly identified career goals relevant to the program and who demonstrate a strong academic background. Those without the required professional training or experience should consider an 80-credit master of science program offered by one of the HSPH departments.

Students currently enrolled in MD, DO, DMD, or DDS programs (and some law students) who have a career interest in public health and/or preventive medicine are also eligible to apply for admission to the MPH program. Medical and dental students undertake the MPH program while on leave of absence between the third and fourth year of medical or dental school. They receive the MPH degree upon successful completion of both programs and conferral of the doctoral degree. The MPH program serves as a required academic year for residency training in general preventive medicine, aerospace medicine, or occupational and environmental medicine.

Students accepted to Harvard Law School may simultaneously pursue an MPH under Harvard's JD/MPH joint degree program. Prospective students should apply to the joint program either concurrently with their application to Harvard Law School or during their first year of law school. HSPH course work begins in the summer following the first year of law school and continues over the next two years.

MPH students are required to complete a minimum of 42.5 course credits and must fulfill core requirements in the fundamental public health disciplines (see page 5) and a course on the ethical basis of the practice of public health. Within their selected concentration students choose a second tier of recommended or required courses and complete a practice course, which generally serves as the required culminating experience, following concentration guidelines. Beyond the program and concentration requirements, students are encouraged to consult with faculty advisers to choose elective courses best suited to their needs. Requirements and concentration guidelines are available from the Office for Educational Programs.

MPH candidates may complete the degree requirements on a full-time or part-time basis (or may change from one status to the other). Full-time students normally complete the program in two consecutive semesters (September through May). Part-time students complete the requirements for the degree over a period of two or three years. Students may elect to begin their course work in July by enrolling in the Summer Session for Public Health Studies; those interested in this option should contact the Office for Educational Programs for guidance.

A summer-only MPH program is also available for students in two concentrations: quantitative methods and clinical effectiveness. The program can be completed by taking courses in three consecutive enrollments in the Summer Session for Public Health Studies; students in this program

can also take courses during the HSPH WinterSession. Students wishing to apply for the summer MPH in quantitative methods or clinical effectiveness must observe the same admissions deadlines as all MPH degree applicants.

Concentration goals and areas of interest are described below:

Clinical effectiveness Concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment, the concentration is designed to provide the analytic and quantitative training necessary to evaluate clinical practices. Major areas of professional interest for concentrators include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life. The concentration is limited to clinicians enrolled initially in the Summer Program in Clinical Effectiveness.

This concentration prepares physicians for clinical research responsibilities and for leadership roles in evaluating and improving all aspects of health care delivery. Along with the broad perspective the program offers on general aspects of public health, this training provides a basis for identifying the health policy implications and public health benefits of clinical investigations.

Family and community health This concentration focuses on the promotion of health and the prevention of disease, especially in more vulnerable populations. Course work emphasizes strategies for needs assessment and establishment of health objectives, data collection and analysis, leadership skills, consultation, communication, advocacy, and policy formation in the public sector. Beyond the MPH core requirements students are encouraged to develop expertise in a focus area geared to their professional interests. Areas of interest include maternal and child health, women and health, mental health, violence and substance abuse, health disparities, community health, health promotion, and disease prevention.

The program prepares students for working in diverse spheres, including federal, state, and local government; advocacy groups; voluntary health organizations; and community-based primary care settings in the United States and other countries. Posts filled by graduates of this concentration include state health director; medical director of programs for child, adolescent, or women's health; health policy analyst; and health educator. Other graduates have gone on to academic positions.

Health care management and policy This concentration offers training with either a management or a policy focus. In addition to fulfilling the MPH core requirements, students select from clusters of courses to gain depth in their chosen area. Students choosing the management area of interest take courses providing practical management skills, such as accounting, finance, operations, marketing, information systems, quality improvement, management of people, and strategy determination. Students selecting the policy focus take courses in health economics, political science, and applied policy in areas like payment systems, insurance, mental health and substance abuse, community health, and health promotion and disease prevention.

Graduates assume leadership positions in health care organizations that provide direct care (such as hospitals, group practices, and home health agencies), those that pay for and/or organize health care (such as governments, health insurers, and health maintenance organizations), and those that supply direct-care providers (such as pharmaceutical companies and biotechnology firms). Program graduates fill many roles—from consultants and staff analysts to middle-management and executive positions.

International health This concentration enables students to work toward health improvement by taking account of demographic and epidemiologic changes; the organization of health care and evolving patterns of health care demand; new scientific knowledge and technology; and the roles of professionals in policy, law, communications, and advocacy. It also assists them in finding new ways to strengthen national and institutional capacities for health policymaking and management. The international health concentration has several areas of professional interest, including international health policy and management; population, reproduction, and child health; infectious disease epidemiology; research and evaluation methods; health promotion; and humanitarian studies. The last area focuses on population support during war, civil conflict, or disaster and features a three-month summer field placement.

The program is intended to prepare health professionals with prior international health experience for leadership roles in the practice of international health, with a special emphasis on the populations in developing countries. Graduates of the program work in national ministries of health, internation-

al organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

Law and public health The course of study introduces lawyers to the science of public health, provides them with skills in analysis of public health problems, and allows them to design a curriculum that will meet their particular interests. Beyond the MPH core requirements, which include law-related courses, lawyers are encouraged to develop an area of interest by choosing elective courses in a specific field such as health care delivery or environmental health.

The concentration is designed to train leaders in the field of public health law. Graduates are prepared for careers in a variety of settings, including health or environmental law work in a law firm, nongovernmental organization, or in-house counsel's office; policy positions in local, state, and federal government; or posts in academia.

Occupational and environmental health This concentration focuses on workplace and environmental hazards, the physiologic and biomechanical aspects of work, the risks posed by the interaction of genetic and environmental factors, and a practical approach to solving health problems in various work and community settings. The concentration features three areas of interest: occupational/environmental medicine, occupational health, and environmental health.

The program is designed for physicians and other professionals who intend to practice occupational/environmental medicine or to hold responsible positions in occupational and/or environmental policy and management. The occupational/environmental medicine area fulfills the first-year requirements of the two-year Occupational and Environmental Medicine Residency. This area is also intended for other physicians who wish to satisfy the didactic requirements of the American Board of Preventive Medicine for certification in occupational and environmental medicine. The requirements for the master of occupational health (MOH) degree are similar to those of the MPH in occupational medicine; physicians may elect either degree.

Quantitative methods The concentration emphasizes study design, data analysis, and the application of quantitative methods to decision making and to research in public health. Beyond the MPH core requirements concentrators must take an additional 2.5 credits of introductory epidemiology and 7.5 credits in intermediate/advanced biostatistics, epidemiology, or decision sciences and an approved practice course in the Spring 2 term. At HSPH and elsewhere within the university, concentrators may choose from advanced quantitative courses that include biostatistics, epidemiology, decision sciences, demography, needs assessment, and evaluation.

The program is geared toward health professionals requiring analytical and statistical skills for successful public health practice and research. It is designed for both mid-career health professionals and those in the early stages of their careers. Program graduates commonly supervise population-based health research in government, health care institutions, and private industry. Many graduates practice in academic medicine.

Related Offerings

Master of occupational health, see page 13.
Occupational and Environmental Medicine Residency, see page 14.
Summer Program in Clinical Effectiveness, see page 59.
Summer Session for Public Health Studies, see page 59.

Contact Information

For more information about the MPH program or the summer MPH in quantitative methods or clinical effectiveness, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Educational Programs, 677 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-0090
Fax: 617-432-3365
Email: roberta@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mph

LANA DINIC

Doctoral student, Division of Biological Sciences

Growing up in Zagreb, Croatia, Lana Dinic excelled in science and mathematics competitions but did not take them very seriously. "I mostly went for the sandwiches," she laughs. Lana arrived in the United States during her high school years, when she focused on learning English. Her family resisted when she decided to attend college in the United States, but a generous offer from Mount Holyoke College proved decisive. Lana says, "I had wanted to go to school in New York City. Instead of skyscrapers, there I was among open fields and farms." In the end, however, she loved Mount Holyoke. "I made the best decision of my life. I chose biochemistry as my major because it seemed the most challenging," she explains. Lana also minored in international relations and became involved in the Model United Nations, two experiences that oriented her toward public health. She came to HSPH in 2006 as a PhD student in the Division of Biological Sciences. Currently working in the lab of Associate Professor Anne Goldfeld, Lana says she is "inspired" by Dr. Goldfeld's ability to do high-level research on HIV-tuberculosis co-infection while establishing health clinics in Cambodia. Ultimately, Lana says, "I want to work on infectious diseases, to advance public health through scientific research."

DIVISION OF BIOLOGICAL SCIENCES

The Division of Biological Sciences is an umbrella organization encompassing the HSPH Departments of Environmental Health, Genetics and Complex Diseases, Immunology and Infectious Diseases, and Nutrition. In most of these departments, two doctoral degrees are offered: the doctor of philosophy (PhD) and the doctor of science (SD). The PhD programs generally center on laboratory-based investigation in the biological sciences, whereas the SD programs emphasize epidemiological analysis. The PhD program is administered by the Division of Biological Sciences.

Doctor of Philosophy in Biological Sciences in Public Health

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD Program in Biological Sciences in Public Health (BPH). This program offers the PhD degree through the Harvard University Graduate School of Arts and Sciences.

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

To qualify for admission, applicants must demonstrate strong enthusiasm and capacity for the vigorous pursuit of scientific knowledge. Minimum requirements include a bachelor's degree and undergraduate preparation in advanced-level biology and chemistry (both physical and organic), calculus, and physics appropriate for mastery of the biology material. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take the GRE general test in time to meet the application deadline of December 7, 2007. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The BPH program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. The program also features interdisciplinary training, with students taking courses in several different departments to meet their individual requirements. All students complete courses in a minimum of four of the seven core areas (molecular biology, cell biology, biochemistry, genetics, physiology, toxicology/cancer cell biology, immunology/infectious diseases). Other requirements for the first two years of study include the following: courses in epidemiology, biostatistics, and the conduct of science; three ten-week laboratory rotations; and two critical-reading courses. Elective courses taken during the first two years cover principles of toxicology, introductory cancer biology, genetic toxicology, cell response to mutagens and carcinogens, human physiology, advanced respiratory physiology, advanced topics in physiology, immunology, cellular and molecular biology of parasites, and the science of human nutrition. At the end of the second year, students must take a preliminary qualifying examination to assess their ability and preparation for an original, laboratory-based scientific investigation. Students must also write and defend a dissertation, generally within five or six years of beginning the program.

Participating HSPH departments offer PhD programs in the following areas:

- genetics and complex diseases (molecular mechanisms of adaptive responses to stress; molecular and cellular toxicology; radiobiology; nutritional biochemistry; genetic and molecular mechanisms of chronic diseases such as obesity, diabetes, and cancer)
- environmental health (molecular and integrative physiological sciences)
- immunology and infectious diseases (immunology and molecular biology of parasitic and other infections)
- nutrition (biochemistry; cardiovascular biology)

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. Harvard University presidential funds also support international doctoral students. A universitywide fellowship program provides funding to qualified underrepresented minority students in the sciences.

Contact Information

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/apply/apply_3.php

The GSAS application in hard copy is available at the same web address.

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2932
Fax: 617-432-4033
Email: rkenwort@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/bph

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.harvard.edu/registrar/courses.

Biological Sciences Seminars

Pathophysiology of Human Disease

Independent Study, Laboratory Rotations

Division of Public Health Practice

The Division of Public Health Practice (DPHP) was created in 1997 in response to a national call by the Institute of Medicine for greater emphasis on public health practice. With the mission of translating theory into practice, and learning into advances that protect the health of all, DPHP serves as a bridge between the Harvard School of Public Health and governmental agencies, other institutions, and the broader community. The division sponsors a number of events, including special lectures, an annual Open House, and Community Partnership Day. DPHP research initiatives encompass health disparities and community health, health policy, tobacco control, and violence prevention; the division also houses the Center for Public Health Preparedness. DPHP works closely with the HSPH Office for Educational Programs to coordinate practice opportunities for HSPH students by matching them with appropriate host agencies, institutions, and community organizations. In addition, the division facilitates student involvement and leadership development through its DPHP Student Advisory Council and support of the Yerby Postdoctoral Fellowship Program.

Contact Information

For more information on the Division of Public Health Practice or the programs and practice opportunities sponsored by the division, please visit the web address below:
Web: http://www.hsph.harvard.edu/php

You may also contact Betty Johnson, associate director of student practice support, Division of Public Health Practice, Landmark Center, 3 East, 401 Park Drive, Boston, MA 02215.
Phone: 617-496-8064
Fax: 617-495-8543
Email: bljohnso@hsph.harvard.edu

Interdisciplinary Concentration in the Epidemiology of Infectious Disease

Education and research on aspects of infectious disease occur in a number of HSPH departments, including the Departments of Biostatistics, Epidemiology, Health Policy and Management, Immunology and Infectious Diseases, and Population and International Health. These departments participate in the interdisciplinary concentration in the epidemiology of infectious disease, which focuses on population studies incorporating both epidemiologic and laboratory methods. This concentration is intended to provide training for those students who desire careers in research and teaching in infectious disease. As the concentration is a nondegree program, prospective students must apply to a program in one of the participating departments, which will issue the degree. Upon matriculation students may then elect to participate in this concentration. Students are responsible for fulfilling the requirements of the academic program within the home department in addition to the requirements of the concentration.

Contact Information

For more information about research and training in the epidemiology of infectious disease, please contact Elizabeth Groom, program coordinator, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115, or visit the concentration website.
Phone: 617-432-1498
Fax: 617-566-7805
Email: egroom@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/idepi/index.html

Interdisciplinary Concentration in Women, Gender, and Health

This interdisciplinary concentration is geared toward students who desire careers in research, teaching, and programs related to women, gender, and health. Addressing issues of women, gender, and health (WGH) requires the study of the health of women and girls—and men and boys—throughout the life course, with gender, gender equality, and biology understood as important and interacting determinants of well-being and disease. As the concentration does not offer a degree, prospective students must apply to a degree program, which can be in any department. Students must fulfill the requirements of the home department, which issues the degree, and the requirements of the concentration, which include core courses in women, gender, and health; gender analysis; and women's health.

Contact Information

For more information about research and training in women, gender, and health, please contact the WGH program office, Building 1, Room 1202, 665 Huntington Avenue, Boston, MA 02115, or visit the concentration website.
Phone: 617-432-3690
Fax: 617-432-3755
Email: wgh@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/wgh

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Women, Gender, and Health

Advanced Topics in Women, Gender, and Health

Women, Gender, and Health: Critical Issues in Mental Health

Women, Gender, and Health: Introductory Perspectives

Independent Study

Research Centers

HSPH has established a number of institutes and centers to advance research in areas of importance to public health. These efforts tend to be multidisciplinary in their approach, bringing together faculty members from several HSPH departments and in some cases from several faculties at Harvard University. Faculty affiliated with the centers offer courses in their field of interest through the school's academic departments and often provide opportunities for student involvement in research. Schoolwide research centers currently include the Center for Health Communication, François-Xavier Bagnoud Center for Health and Human Rights, HSPH AIDS Initiative, Harvard Center for Population and Development Studies, Harvard Center for Society and Health, and Harvard Injury Control Research Center.

Summer Program in Clinical Effectiveness

The Summer Program in Clinical Effectiveness—affiliated with Brigham and Women's Hospital, Massachusetts General Hospital, and Harvard Medical School—is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Candidates must be fellows or faculty members and are usually sponsored by their clinical departments or divisions. Students attend an intensive, seven-week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants who apply and are admitted to a degree program may apply these academic credits toward the requirements for either a master of public health (MPH) or a master of science (SM) degree.

HSPH offers two specifically relevant degree programs: the MPH with a concentration in clinical effectiveness and the SM in epidemiology, with an area of interest in clinical epidemiology. Qualified participants may fulfill requirements for the summer-only SM in epidemiology by attending classes during a second summer period and completing a supervised research project (7.5–12.5 credits). Qualified participants may fulfill requirements for the MPH in clinical effectiveness by attending classes during second and third summer periods and by completing a supervised 5-credit practicum.

Related Offerings

Clinical epidemiology area of interest, Department of Epidemiology, see page 19.

Contact Information

For information about the Summer Program in Clinical Effectiveness, or to request application materials, please contact Barbara Rosen, administrator, Program in Clinical Effectiveness, Division of General Medicine and Primary Care, Department of Medicine, Brigham and Women's Hospital, 1620 Tremont Street, Boston, MA 02120-1613.
Phone: 617-732-5648
Fax: 617-732-5344
Email: brosen@partners.org
Web: http://www.hsph.harvard.edu/clineff

Summer Session for Public Health Studies

The Harvard Summer Session for Public Health Studies introduces students to the core areas of public health in two intensive sessions. Courses in the program help students develop the ability to define, assess, and evaluate the health needs of populations; to participate in the development of health policy; and to ensure the delivery of health services.

Students in the Summer Session attend one or two three-week sessions in July and August. The 2007 curriculum includes courses in biostatistics, epidemiology, health care management, health policy, ethics, environmental health, and social and behavioral science. Each course offers 2.5 credits, and the maximum recommended course load is 5 credits (two courses) per session. Because the course work is very intensive and fast paced, students registered for two courses in a session should not have other work commitments.

The Summer Session is intended for health professionals in training or those who are considering a midcareer change into public health and feel the need to strengthen their skills. Participants include public health professionals, primary care practitioners, physicians engaged in the evaluation of health care delivery and management, physicians in training (including preventive medicine residents and medical students in an MD/MPH joint-degree program), and candidates for a part-time MPH program. Students accepted for admission to an HSPH degree program may choose to begin their studies early by enrolling in the Summer Session; these students will have greater flexibility in course selection during the academic year. Other students may subsequently seek admission to an HSPH degree program. Students eligible for the MPH in the quantitative methods or clinical effectiveness concentrations may apply for a summer-only MPH, which must be completed in three consecutive summers.

Related Offerings

MPH concentrations in clinical effectiveness and in quantitative methods, see pages 54 and 55.

Contact Information

For more information about the Summer Session, please contact Hildi Keary, administrative assistant for summer programs, Office of Enrollment Services, 677 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-1052
Fax: 617-432-2009
Email: hkeary@hsph.harvard.edu
(specify Summer Session on subject line)
Web: http://www.hsph.harvard.edu/summer/brochure

For more information about the summer-only MPH degree program, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Educational Programs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
Email: roberta@hsph.harvard.edu

Admission to Degree Programs

The admissions information in this section pertains to applications for degree programs offered by the Harvard School of Public Health. Applicants should contact the Admissions Office or consult the web for complete instructions and application forms. Information on HSPH minimum entrance requirements can be found on page 5. Note that application forms for PhD programs, offered under the auspices of the Harvard University Graduate School of Arts and Sciences (GSAS), are different from those used by applicants to programs administered by HSPH; these forms must be obtained directly from GSAS.

HSPH Application Deadlines

Applications may be submitted beginning on September 1, 2007.

December 15, 2007, is the deadline for complete applications for all HSPH doctoral (SD and DPH) and master of science (SM) programs except as explained below.

December 15 is also the deadline for applications to the MPH, MOH, and SM in health care management programs in the priority admission cycle. February 15, 2008, is the deadline for completing applications to MPH, MOH, and SM in health care management programs for review in a second cycle. Applicants should be aware that these degree programs may fill to capacity during the priority admission cycle.

Participants in the Summer Clinical Effectiveness and Summer Session programs matriculating in the 2008 summer program and wishing to apply for degree candidacy must meet the application deadlines outlined above.

Applicants to the MPH or MOH programs who wish to participate in the Occupational and Environmental Medicine Residency must apply by October 1, 2007.

Application Procedures and Requirements

Application to the Harvard School of Public Health is made through the centralized Schools of Public Health Application Service (SOPHAS). For more information about this process, please consult the HSPH Admissions Office website (http://www.hsph.harvard.edu/admissions).

Required application materials consist of the following:

- A completed and signed application form, a resume, and a 500-word essay written by the applicant. The essay should describe the applicant's academic and professional history, area of interest at HSPH, reasons for wanting to enroll in the degree program, and professional or academic career plans upon completion of the program.

- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the courses taken appear to be relevant to a degree in public health. Applicants are expected to have a distinguished undergraduate record, as well as excellent performance in any graduate work undertaken.

- Letters of recommendation from at least three people who are well acquainted with the applicant's academic work and/or professional experience (recommendation forms are provided in the application).

- Official scores of the Graduate Record Examination (GRE). While GRE scores are strongly preferred, some other tests may be substituted in circumstances specified in the application. The requirement for scores from a standardized test will not be waived on the basis of academic or professional background.

- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. Applicants (including those who have been U.S. citizens or permanent residents for less than one year) from countries where English is not the language of instruction must submit a score from the TOEFL. Those who have already taken the TOEFL may submit the score as long as it is not more than two years old. The International English Language Testing System (IELTS) exam will be accepted if the applicant's score is 7.0 or above.

- A nonrefundable application fee to SOPHAS (the amount will vary according to the number of schools designated to receive the application). HSPH does not charge an application fee.

Applicants may apply to only one degree program and must satisfy the requirements of the department or program to which they are applying. Those applying to the JD/MPH joint degree program with Harvard Law School or an MD/MPH combined degree program with Harvard Medical School or another medical school must satisfy the entrance requirements to both schools. Applicants to doctoral programs must demonstrate the ability to undertake original research. All prospective students must apply for either full-time or part-time status. Most international students are eligible for full-time study only.

Admission is granted for the fall semester of a particular year (currently September 2008). Students unable to enroll at that time may request a deferral but may be required to reapply.

Application Review

Applicants are notified as soon as possible (in writing) about the status of their application. The Admissions Office will either confirm that an application is ready for review or will specify any missing documents. The decision of the Committee on Admissions and Degrees is final and is not subject to appeal.

For all HSPH programs the Committee on Admissions and Degrees considers the academic ability of applicants, the relevance of their previous education and experience, and their overall qualifications for graduate education in public health, including those qualities of character that reflect upon an individual's suitability to be a public health professional. In decisions about admission and financial aid, HSPH does not discriminate against individuals on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability. The increased participation of underrepresented groups in public health practice and research is essential to the advancement of health, and the school is committed to expanding the diversity of its faculty, staff, and student body.

Tuition Deposit and Financial Certification

Applicants who are granted admission must submit a $500 tuition deposit when confirming acceptance of the offer of admission. This deposit, which is nonrefundable, will be applied toward the student's tuition and fees.

Accepted applicants who are not U.S. citizens or permanent residents must demonstrate that sufficient funds are available in U.S. currency to pay the costs (tuition, fees, and living expenses) of the full period of their academic program. International students supported by personal, family, or sponsors' funds not paid directly to Harvard University are required to deposit and retain adequate funds in a Boston-area bank in an account bearing the student's name. Students bringing their families to the United States must transfer and certify adequate funds for their support as well. (Please see page 63 for an estimate of living expenses in the Boston area.)

Tuition and Fees, July 2007–June 2008

Tuition for full-time 1-year master's degree students	
(based on 42.5 credits)	$34,085 per year
Tuition for full-time 2-year master's degree students and special students	
(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	$32,080 per year
Tuition for part-time master's degree students, special students, and affiliates	
(1–19 credits per semester, fall and spring, with a maximum of 15 summer credits. Part-time students may accrue 45 credits for the comparable full-time tuition rate.)	$ 802 per credit
Tuition for nonresidential master of science in health care management	
(2007–09 cohort)	$51,500 total for two-year program
Tuition for full-time-resident doctoral students	
(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	
Full-time, years 1 and 2	$32,080 per year
Full-time reduced, year 3	$16,040 per year
Facilities fee, year 4 to thesis defense	$ 4,010 per year
Dissertation defense fee (final semester before graduation)	$ 1,770 one semester
Tuition for part-time-resident doctoral students	
Credits 1–80	$ 802 per credit
Credits 81–120	$ 401 per credit
Credits 121 to thesis defense	$ 100 per credit
Dissertation defense fee (final semester before graduation)	$ 1,770 one semester
Tuition for nonresident doctoral students, full-time or part-time	**$ 2,219 per year**
Tuition for Summer Session 2007	$ 802 per credit
Fees	
Registration fee (summer, fall, spring)	$ 125 per semester
Late registration fee	$ 80
Leave of absence fee	$ 125 per semester
Health fees (see page 62)	
Academic records fee (one-time fee)	$ 10

Note: Tuition rates are given in 2007–08 tuition dollars. Continuing students should expect annual increases.

Admission to Nondegree Status

Affiliates

Harvard faculty and staff, employees of Harvard-affiliated hospitals, HSPH alumni, and certain other Boston-area public health professionals may register for a maximum of 10 credits per semester as nondegree affiliates of the school. Affiliates must register in person at the HSPH Registrar's Office.

Enrollment of affiliate students in specific courses is subject to the availability of

space and permission of the instructor and the registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment is on a per-credit basis and is due at the time of registration. Payment is not refundable unless the student is unable to take the desired course because it is filled to capacity. Affiliate students may neither audit courses nor cross-register at other Harvard schools or MIT.

Special Students

Individuals who do not fall into one of the categories listed above may apply for special student status. Applicants for special student status are subject to the same admission and registration requirements, deadlines, and procedures as applicants for degree candidacy. U.S. citizens and permanent residents may apply to the Admissions Office for full-time or part-time special student status. As noted previously, foreign applicants are eligible for full-time status only. Admission to special student status is limited to one academic year. The deadline for applying for special student status is December 15, 2007.

Subsequent Application for Degree Candidacy

Affiliates and special students wishing to be admitted to degree candidacy must apply and will be considered on the same basis as other applicants for admission. At the time of their application, affiliates and special students who have taken courses at the school within the preceding three years may count up to 20 credits retroactively as part of the academic credit requirements.

Up to 20 credits of tuition previously paid to HSPH may be counted toward the school's tuition requirement for the degree program.

Financial Aid

Estimated Student Expenses

The budget information on page 63 is intended to provide students with an estimate of how much it will cost to spend nine months at HSPH. These figures are for the 2007–08 academic year; applicants for subsequent years should anticipate increases.

Matriculation in Summer Programs

Tuition for the Clinical Effectiveness Program and the Summer Session for Public Health Studies in 2007 is $802 per credit. HSPH offers a special program in English communication in advance of the regular orientation for entering students; tuition for the English communication seminar is $800 for summer 2007. Living expenses, including rent, are about $1,808 a month.

Health Fees, September 2007–August 2008

University Health Services (UHS) Fee	Semester	Year
Individual	$713	$1,426
Family (student plus spouse)		3,218
Family (student plus spouse and one child)		4,010

The University Health Services (UHS) provides comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, psychological counseling, and emergency services. The UHS fee is compulsory for all degree candidates and special students registered for more than 10 credits in a semester. Others may elect to waive UHS coverage; this must be done before September 30 for fall and March 31 for spring.

Blue Cross/Blue Shield (BC/BS) Medical Insurance	Semester	Year
Individual	$681	$1,362
Family (student plus spouse)		3,072
Family (student plus spouse and one child)		4,098

The Blue Cross/Blue Shield (BC/BS) plan provides extensive benefits for ambulatory and inpatient care not offered at UHS. BC/BS coverage is compulsory for all nonimmigrant international students and for all other students who do not have comparable insurance. International students whose spouse and/or children will also be living in the United States are required to enroll in the family plan. U.S. students who have comparable insurance may elect to waive BC/BS coverage; this must be done by September 30 for fall and March 31 for spring.

Note: UHS and BC/BS coverage extends from September 1 through August 31.

Sources of Financial Aid

The Office of Student Financial Services and academic departments make every effort to assist students in finding resources to finance their education at HSPH. It should be noted that the school's need-based grants are extremely limited. Students are urged to investigate all sources of support, including employers, government agencies, and civil and religious organizations.

Financial aid is available in the form of grants, scholarships, loans, and work programs, as follows:

Grants and scholarships The Office of Student Financial Services and some academic departments may have grants or departmental scholarships that cover partial or full tuition; some grants also provide a stipend. Eligibility is generally based on career goals, academic merit, experience, and U.S. citizenship or permanent residency. Please contact the department to which you are applying for additional information.

The university offers a number of restricted scholarships to students who meet specific criteria. Please refer to the HSPH financial aid application for more information. An HSPH application for financial aid is required.

Federal student loans The Office of Student Financial Services administers the Federal Direct Loan and Federal Perkins Loan programs. The maximum amount a student may receive under the direct loan program is $18,500 per academic year. Some full-time students may be eligible for an additional $12,500. Students with extreme financial need may also be eligible for a Perkins loan up to $6,000. To apply for these loan programs, a student must

- be a U.S. citizen or eligible nonresident
- not be in default on a prior federal loan or owe a refund on a federal student grant
- be enrolled at least half-time (10 or more credits per semester)
- complete the financial aid application process

Alternative student loans The Harvard University Loan Program requires no fees or co-applicants and has a low interest rate of prime less 0.125 percent. Students are usually eligible regardless of their creditworthiness. Loan funds for international students are limited. The loan amount is determined by HSPH.

Work programs Some students may obtain part-time employment as research or teaching assistants in their academic departments. Additionally the school participates in the Federal Work-Study Program, which subsidizes between 50 percent and

75 percent of the on- or off-campus employer's costs. Eligibility for this program is the same as for federal student loans.

Please refer to the student financial services website for additional and updated information about loan and work programs.

Registration

Students receive course descriptions and information about course meeting times, registration procedures and requirements, course load requirements, and payment of tuition and fees prior to registration. Every resident degree candidate is expected to check in, in person, on the specified date. (August 28 for new students and September 4 for returning students in academic year 2007–08).

Cross-Registration

HSPH students may enroll in courses offered by the other Harvard faculties, MIT, and the Fletcher School of Law and Diplomacy at Tufts University. Students intending to cross-register should be aware that registration deadlines and academic calendars vary from school to school; these students must conform to the registration requirements of the school into which they are cross-registering as well as those of HSPH.

Harvard University maintains an online catalog of all courses offered at the university. This catalog is searchable by school, topic, time, and instructor. Also listed at this site are relevant, school-specific cross-registration policies and credit equivalencies. The address for the site is the following: https://crossreg.harvard.edu/OASIS/CrossReg/index.html

Contact Information

Prospective degree candidates or special students who wish to request application materials, have questions about admission requirements, require assistance with the application process, or wish to visit the school should contact the HSPH Admissions Office, 158 Longwood Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1031
Fax: 617-432-7080
Email: admisofc@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/admissions

For more information about billing procedures or the financial aid application process, please contact the HSPH Office of Student Financial Services, 708 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1867
Fax: 617-432-5431
Email: osfs@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/finaid

For information about registration, admission to affiliate status, or policies regarding cross-registration, please contact the HSPH Registrar's Office, 677 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1032
Fax: 617-432-2009
Email: registra@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/registrar

For more information about student health insurance, please contact the Student Insurance Office, Harvard University Health Services, 75 Mt. Auburn Street, Cambridge, MA 02138, or visit the office website.
Phone: 617-495-2008
Fax: 617-496-6125
Web: http://www.uhs.harvard.edu

For the PhD programs online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web:http://www.gsas.harvard.edu/apply/apply_3.php

2007–08 Student Expense Budget

		1-year master's programs	Doctoral and 2-year master's programs
Full-time tuition[1]		$34,085	$32,080
University Health Services fee[2]	$ 713 per semester	$ 1,426	$ 1,426
BC/BS health insurance fee[3]	$ 681 per semester	$ 1,362	$ 1,362
Registration fee	$ 125 per semester	$ 250	$ 250
Books/supplies	$ 673 per semester	$ 1,346	$ 1,346
Living allowances			
Rent/utilities	$1,022 per month	$ 9,198	$ 9,198
Food	$ 328 per month	$ 2,952	$ 2,952
Personal	$ 386 per month	$ 3,474	$ 3,474
Local transportation	$ 72 per month	$ 648	$ 648
SUBTOTAL[4]		**$54,741**	**$52,736**
Federal student loan fees[5]	3%	$ 555	$ 555
TOTAL		**$55,296**	**$53,291**

1. For part-time students, tuition charges are assessed based upon the number of credits for which a student is registered. For 2007–08 the charge is $802 per credit hour. Please refer to the HSPH Tuition and Fees Schedule for more information on billing procedures and payment requirements for part-time students. This is available from the HSPH Registrar's Office by calling 617-432-1032.
2. Part-time students taking 10 credits or fewer may waive the University Health Services fee if a waiver form is completed prior to registration.
3. The BC/BS health insurance fee can be waived upon proof of comparable coverage. Students with a spouse and/or children may request family coverage at a fee of $3,072 for a student and spouse; $2,388 for a student and child; $4,098 for a student, spouse, and child; and $4,614 for a student, spouse, and children.
4. International students in the 1-year master's programs must be able to demonstrate a 9-month level of support of this level ($54,741) prior to the issuance of an appropriate visa. Other master's degree and doctoral candidates must demonstrate a 12-month support level of at least $58,160. Students with additional family members must demonstrate the following levels of support:

	Student & spouse	Student & child	Student, spouse, & child*	Student, spouse, & 2 children*
9 month (1-year programs)	$62,671	$60,359	$65,679	$67,943
12 month (1-year programs)	$69,571	$67,043	$72,969	$75,683
12 month (multiyear programs)	$67,566	$65,038	$70,964	$73,678

*For each additional child, add $1,485 for the 9-month and $1,980 for the 12-month budget.

5. Loan fees are based on borrowing $18,500 in Federal Direct Loans, available to U.S. citizens and permanent residents only.

Boston, Massachusetts

The Harvard School of Public Health is located in Boston, Massachusetts, an important center of American history, culture, commerce, and education. Boston is New England's largest city and one of America's oldest. A wealth of historical buildings and sites evokes the city's colonial past while providing a striking contrast to the skyscrapers of the business district. The Greater Boston area is home to more than a hundred colleges and universities and many renowned teaching and research hospitals.

The area hosts major art museums, museums devoted to science and children, the famous Boston Symphony and Boston Pops, several professional theater companies, and a number of professional sports teams. The city also offers elegant shopping and diverse dining, from casual ethnic restaurants to haute cuisine. Compact in scale, Boston invites walking but furnishes extensive public transportation.

The proximity of Cape Cod and Maine beaches, the mountains of Vermont and New Hampshire, and the charming villages of New England add to the appeal of Boston, one of America's most desirable places to live and study.

Harvard University

Founded in 1636, Harvard University is the oldest institution of higher learning in the United States. It has educated seven presidents of the United States, and its faculty has produced more than forty Nobel laureates. Today Harvard has an enrollment of more than 18,000 degree candidates, and an additional 13,000 students are enrolled in the Harvard Extension School. Including HSPH, the university has ten graduate and professional schools. Its ninety individual collections constitute the largest academic library in the world. Ten art and science museums further enrich the quality of intellectual life.

The university has campuses both in Cambridge, Massachusetts, and in Boston.

Resources and Services for HSPH Students

The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine and are near Children's Hospital Medical Center, Beth Israel Deaconess Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is within walking distance of many cultural institutions, such as Boston's Museum of Fine Arts, and public transportation is readily available to other parts of Boston and Cambridge, where students may cross-register for courses at other Harvard schools and at MIT. A shuttle bus runs between the Longwood campus and Harvard Yard in Cambridge.

Francis A. Countway Library of Medicine

The Countway Library is the principal provider of library services to the school. The Countway, one of the largest medical libraries in the world, houses over 630,000 bound volumes, 3,500 current biomedical journal titles, and 10,000 noncurrent titles. The library's website provides access to additional full-text journals in the biosciences and medicine and to many electronic databases. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Students have borrowing privileges throughout the Harvard University library system. The Boston Public Library, MIT libraries, and other area libraries add to the total book and periodical resources available.

Instructional Computing Facility

The HSPH Instructional Computing Facility is dedicated to serving the course work and research computing needs of the school's students and faculty. Resources include SUN Unix computers, 125 IBM personal computers, a Novell network, laser printers, and an OCR scanner; a wide array of software, including statistical packages, programming languages, analytical programs, and word-processing packages; and services such as file transfer, electronic mail, connections to the Internet, user assistance, short courses, and computer accounts for funded research. Many academic departments also provide computing resources for their students. Additional services, such as computer classes, discounted hardware and software, user groups, and technical support, are available through the offices of Harvard's University Information Systems.

Office for Student Affairs

The Office for Student Affairs (OSA) provides a variety of support services and offers educational, social, and cultural programs to enhance the student experience at HSPH. Staff members are available to respond to the needs of individual students as they deal with the many demands of their academic and personal lives. The staff helps students and their families who have questions about living in Boston and the United States and also assists foreign students in adjusting to life here. The office also works closely with student government and other student groups to address collective student concerns. OSA sponsors noncredit academic support seminars on such topics as general and dissertation writing and can refer students to other sources of academic support. Another activity sponsored by the office is Global Chat, a seminar series featuring experts from around the world, including HSPH students, who share their experiences in an informal setting. The office also oversees the leasing process for the residential facilities and provides assistance to students with disabilities.

Student housing The Henry Lee Shattuck International House, available to both domestic and international students, is operated by the school on a nonprofit basis for its full-time students and their families. In addition to providing living quarters, the facility offers a supportive environment for HSPH students. Located within a ten-minute walking distance of the school, the apartment complex consists of three buildings with seventy furnished one-bedroom and two-bedroom apartments that accommodate single students, roommates, and families. Several apartments are accessible to those with disabilities. All apartments have private kitchens and baths, free Internet and email access via a data link to the school, two telephone lines, and interior cable access. Shared facilities include a computer room with a printer and copy machine, a library/reading room, an exercise room, a function room, a children's playroom, a laundry room, an indoor bicycle storage area, a piano room, a TV room with satellite TV and DVD, a recycling area, and an outdoor playground. Applications are processed and apartments assigned on a first-come, first-served basis. Harvard Real Estate Services also offers a wide range of housing options in both Cambridge and Boston.

Students with disabilities The Office for Student Affairs furnishes a range of services to disabled students, including interpreters, tape recordings of class readings, arrangements for appropriate accommodations and transportation, and other services as necessary.

Career Services Office

The Office for Career Services offers career counseling, employment resources, and networking opportunities to assist students and alumni in expanding their employment prospects. The office invites numerous organizations to campus to present information sessions and to participate in the annual Career Fair. Organizations are invited to post jobs, internships, and fellowships and to review electronic resume/CV books for potential candidates. The career services staff conducts workshops on resume/CV and cover letter writing, job search strategies, and interviewing and negotiating skills and organizes panel discussions featuring public health professionals, including HSPH alumni. Students and alumni have access to current online job postings and to fellowship and internship opportunities. The Career Services Office Resource Room contains job listings, resource directories, and other career-related information. The office also maintains Crimson Compass, an online database of universitywide alumni willing to advise students and fellow alumni on various career issues.

Child Care Facilities

There are a number of child care facilities located near the Longwood and Cambridge campuses. Referrals and information are provided by the Harvard University Office of Work and Family. Arrangements should be made as early as possible, as facilities are quickly filled.

International Students

During the 2006–07 academic year, about 27 percent of HSPH students came from outside the United States. The experience international students bring to the school lends an important dimension to the academic program and adds to the diversity of the student population. International students organize many cultural events at the school and participate in the annual International Night talent show.

Harvard International Office

The Harvard International Office, located on the Cambridge campus, provides a variety of services to students from abroad, including orientations, newsletters, and cross-cultural workshops. One program, the Friends of International Students, matches students with a person or family who will welcome them and ease their transition to the United States. International student advisers from the Harvard International Office hold weekly office hours at HSPH to assist students with visa matters and to advise them on immigration regulations.

Student Organizations

The HSPH Student Government includes elected representatives from each department, from the MPH program, and from the Division of Biological Sciences. The Student Government meets regularly to discuss issues and plan activities related to student life at HSPH. The organization also provides a mechanism for working with members of the school's faculty and administration on schoolwide issues, for sponsoring seminars and other educational programs, for organizing social activities, and for arranging for student representation on several of the school's faculty committees. The Student Government frequently sponsors or cosponsors collaborative activities, such as toy drives, with the school and the neighboring community.

Various student organizations at HSPH geared toward the interests of specific constituencies include the Spanish Speaking Committee; the Asian Club; the Lesbian, Gay, Bisexual, and Transgender Alliance; the Jewish Students Association; the Muslim Student Group; the Christian Fellowship; the Health Policy Forum; Reproductive Health and Rights; and Students for Socially Responsive Endeavors.

Office of Alumni Programs

The Office of Alumni Programs acts as a liaison between over 11,000 HSPH alumni and HSPH faculty, students, and administrators. The office develops and implements programs to facilitate alumni access to university resources and serves as a networking forum for students, alumni, faculty, and outside constituencies on local, regional, and international levels.

In addition, HSPH alumni are available to answer questions that potential applicants may have about departments, curricula, and possible career opportunities. The office publishes the HSPH Alumni Directory and disseminates information about programs and events organized by the Harvard Alumni Association. The Office of Alumni Programs also works with the HSPH Alumni Association and the Alumni Council, the association's elected governing body, to organize gatherings in the United States and abroad.

Contact Information

For more information about student services, please contact Stanley Hudson, associate dean for student services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4703
Fax: 617-432-2009

For more information about career services, please contact Peter Crudele, director of career services, 677 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1034
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/careers

For more information about student affairs or students with disabilities, please contact the director, Office for Student Affairs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1036
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/studentaffairs

For more information about Shattuck House and other housing, please consult http://www.hsph.harvard.edu/housing

For more information about Harvard Real Estate Services, please consult http://www.hres.harvard.edu/rre.html

For more information about child care centers in the area, please contact the Office of Work/Life Resources at 617-495-4100. The Medical Center Office of Work and Family can also provide information on support services, resources, and programs.
Phone: 617-432-1615
Web: http://www.hms.harvard.edu/hr/owf.html

For more information about services offered by the Harvard University International Office, please contact Maria Hernandez, adviser to foreign students and scholars, Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138.
Phone: 617-495-2789
Fax: 617-495-4088

For more information about alumni activities or alumni-applicant contacts, please contact Margaret Loret, director of alumni programs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2401
Fax: 617-432-4517
Email: mloret@hsph.harvard.edu

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Online Resources

A wealth of HSPH information can be accessed via the World Wide Web at http://www.hsph.harvard.edu. This site includes updated course, faculty, and educational information and school news. Information about Harvard's other faculties can be found at http://www.harvard.edu.

HSPH Catalog 2007–08

Every effort is made to ensure the information contained in this catalog is accurate at the time of publication. However, the Harvard School of Public Health reserves the right to make changes without notice in tuition and fees, admission and degree requirements, courses of instruction, faculty, and other information contained herein. These changes will govern all students, including those who matriculated prior to the changes coming into effect.

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Nondiscrimination Policy

As a matter of policy, law, and commitment, the Harvard School of Public Health does not discriminate against any person on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or handicap in admission to, access to, treatment in, or employmentin its programs and activities. The following person has been designated to handle inquiries about nondiscrimination programs: Christine Ciotti, associate dean for human resources, Office of Human Resources, 677 Huntington Avenue, Boston, MA 02115. Inquiries about the application of nondiscrimination policies concerning race, color, national origin, age, sex, or handicap may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack POCH, Room 222, Post Office Square, Boston, MA 02109.

Disabilities

The university, in accordance with its obligations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, does not discriminate against qualified individuals with disabilities in admission or access to programs and activities. The Office for Student Affairs assists all students with learning, manual, mobility, hearing, visual, and other disabilities.

Religious Holidays

According to Chapter 151c, Section 2B, of the General Laws of Massachusetts any student in an educational or vocational training institution, other than a religious or denominational training institution, who is unable, because of his or her religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or requirement which he or she may have missed because of such absence on any particular day, provided that such makeup examination or work shall not create an unreasonable burden upon the school. No fees of any kind shall be charged by the institution for making such opportunity available to the student, and no adverse or prejudicial effects shall result to any student for availing himself or herself of these provisions.

Campus Security

In compliance with the Student Right-to-Know and Campus Security Act of 1990, the Harvard University Police Department publishes an annual security booklet entitled *Playing It Safe*. The booklet describes Harvard's security policies, provides statistical information on the occurrence of crime on campus, and outlines some of the counseling programs the university offers. Students may obtain a copy of this booklet from the HSPH Admissions Office, 158 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1031; web: http://www.hupd.harvard.edu).

Voter Registration

Massachusetts state law, as set forth in Chapter 51, Section 42E (Section 17 of Chapter 475 of the Acts of 1993), requires educational institutions to make available affidavits of voter registration. Eligible students may register to vote at registration, and mail-in registration affidavits are available from the Registrar's Office. Students from other states who desire to vote in a state other than Massachusetts may use the federal mail-in affidavit of voter registration or a mail-in form supplied by the state. These students must contact the appropriate state election official to receive the state form or may contact the Massachusetts Elections Division, Room 1705, McCormack Building, One Ashburton Place, Boston, MA 02108, for a federal form.

Accreditation

The Harvard School of Public Health is accredited by the Council on Education for Public Health.

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HSPH ACADEMIC CALENDAR, 2007–08

July 2	Registration for summer programs
July 3	Summer Program in Clinical Effectiveness and Summer Session for Public Health Studies begin
July 3–26	Summer 1 term
July 4	Independence Day, a holiday
July 30–August 17	Summer 2 term
August 20–28	Professional Communication Seminar
August 28–31	Orientation for new students
August 28	Fall semester check-in for new students
September 3	Labor Day, a holiday
September 4	Fall semester check-in for returning students
September 4	Fall 1 term begins
October 8	Columbus Day, a holiday
October 26	Fall 1 term ends
October 29	Fall 2 term begins
November 12	Veterans Day, a holiday
November 22–23	Thanksgiving recess
December 15	Final deadline for application to all doctor of science (SD), doctor of public health (DPH), and most master of science (SM) programs; deadline for application to master of public health (MPH), master of occupational health (MOH), and SM in health care management programs in the priority admission cycle
December 21	Fall 2 term ends
December 24–31	Winter recess
January 1	New Year's Day, a holiday
January 2	WinterSession* begins
January 21	Martin Luther King, Jr., Day, a holiday
January 24	WinterSession ends
January 28	Spring 1 term begins
February 15	Final deadline for application to MPH, MOH, and SM in health care management programs
February 18	Presidents' Day, a holiday
March 21	Spring 1 term ends
March 24–28	Spring recess
March 31	Spring 2 term begins
May 23	Spring 2 term ends
May 26	Memorial Day, a holiday
June 5	Commencement

* WinterSession is a special academic term at HSPH offering opportunities for creativity and innovation in learning and teaching. Credit and noncredit courses and activities for WinterSession, as well as relevant school and departmental policies, are listed at the following website: http://www.hsph.harvard.edu/registrar/WinterSession/index.shtml

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